Otto Bock®

QUALITY FOR LIFE

Xeno
Service Manual

GB
USA

XENO Power Wheelchair Service Instructions

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1 General Information

1.1 Foreword

These service instructions describe all regular maintenance tasks as well as repair and replacement tasks for the Xeno power wheelchair from Otto Bock HealthCare GmbH. They include all information required by dealers in order to correct functional and mechanical defects in components of the Xeno.

The information in these service instructions is essential in order to work on the Xeno correctly and safely. This is why this document, in particular the section “Safety Instructions”, must be read carefully by all persons working on the Xeno. This ensures the functionality of the power wheelchair is fully utilised.

1.2 Support

Your national Otto Bock team will be pleased to answer your technical questions. Contact addresses and telephone numbers are listed on the last two pages of this manual.

2 Security

2.1 Explanation of Symbols

⚠ WARNING	Warnings regarding possible risks of severe accident or injury.
⚠ CAUTION	Warnings regarding possible risks of accident or injury.
NOTICE	Warnings regarding possible technical damage.
INFORMATION	Information regarding operation. Information for service personnel.

2.2 General Safety Instructions

INFORMATION

Regular maintenance is important. It increases safety and prolongs the service life of the product.

⚠ CAUTION

Risk of suffocation. Packaging materials must be kept out of reach of children.

NOTICE

Risk of damage due to unauthorised service. Service and maintenance tasks may only be completed by properly trained authorised personnel. Use only original spare parts for all service and maintenance tasks.

NOTICE

Risk of damage caused by failure to comply with maintenance intervals. Otto Bock recommends having the XENO power wheelchair inspected and maintained for functionality and operational safety by authorised personnel at least once a year. In case of frequent user changes (growing children or youths) or users with changing clinical pictures, the wheelchair should be inspected, adjusted and maintained twice a year.

NOTICE

Risk of damage caused by failure to comply with the service documentation. Familiarity with the service instructions and the instructions for use is essential for proper service.
The service and maintenance instructions must be read carefully before commencing work. The service instructions apply in conjunction with the instructions for use and the spare parts catalogue. All documents must be used together.
All safety instructions contained in these service instructions and all other applicable documents must be observed and complied with. They must be available to service and maintenance personnel at all times.

NOTICE

Risk of damage due to excessive heat or cold. The XENO may only be operated in the temperature range from -25 °C to +50 °C. It must not be operated at temperatures outside this range.

NOTICE

Risk of damage caused by overload. The maximum load capacity for the XENO power wheelchair is 136 kg.

INFORMATION

Familiarize yourself with the functions of the product. If you are not familiar with the product, read the instructions for use prior to inspection. The instructions for use are available from the manufacturer (see overview of all Otto Bock subsidiaries under “Otto Bock Worldwide”). Additional documentation can be downloaded from the Otto Bock homepage at www.ottobock.de or www.ottobock.com.

2.3 Safety Instructions for the Use of Tools and Accessories

⚠ CAUTION

Risk of health impairment due to the use of incorrect tools. When completing the tasks, only use tools that are suitable for the conditions at the place of work and for which safety and the protection of health are assured with proper use.
Verify proper functionality before use. In the use of tools and supplies, also consider the ergonomic relationships between the place of work, tools and supplies, workplace organisation, workflow and tasks; this is particularly important in regards to posture during the use of tools and supplies.

⚠ CAUTION

Risk of health impairment due to the use of improper work clothing. Ensure legally prescribed protective work clothing is worn.

⚠ CAUTION

Risk of injury during tasks that involve lifting. When repair and maintenance tasks must be completed under raised parts or equipment, ensure suitable precautions are taken to secure the applicable components against falling. Equipment used to raise loads must prevent the load from accidentally shifting in a dangerous manner, dropping in free fall or being accidentally released.
When using lifting platforms, ensure that the power wheelchair is centred on the platform and no parts project into the danger area.

⚠ CAUTION

Risk due to hazardous materials. Hazardous materials may only be kept at the place of work in the quantities required for ongoing tasks. Regularly and safely remove waste and residue. Clean up spilled substances immediately.

2.4 Safety Instructions for Service and Maintenance Tasks

⚠ WARNING

Risk of pinching or crushing in the electric seat adjustment and stand-up device ranges. When operating the stand-up device, back angle adjustment (optional) or seat tilt (optional), there are pinch and shear points in the area between the seat frame and wheelchair frame caused by the construction. To avoid injuries, always make sure that no parts of the body, e. g. hands or feet, get into the danger zone, that no interfering objects, e. g. clothing, or obstacles are within the danger zone.

⚠ WARNING

Risk of accident and injury if plug or screw connections come loose. For all setting works or for folding down the backrest for transportation, screw and/or plug connections have to be loosened. This can cause uncontrolled movements of wheelchair components. Especially the backrest can fold to the front or rear when removing the cotter pin (double spring cotter) from the backrest. To avoid injuries at pinch and shear points, carry out such tasks with the support of another person. Make sure to always keep parts of the body (e. g. hands or head) out of the danger zone.

⚠ CAUTION

Risk of injury due to pinch points. For design reasons, there are pinch points between the seat and frame of the Xeno. Special caution is required during all work on the corresponding components.

⚠ CAUTION

Risk of pinching or crushing in the pivot ranges of the armrests and footplate. When swinging the armrests up or down and when flipping the fooplate up or down, make sure your arms and legs are clear of the danger zone.

⚠ CAUTION

Hazards while working on the brake system. Note that there is no braking functionality when the brake is unlocked. The brake must only be unlocked in hazardous situations and for maintenance or repairs. The corresponding force required for acceleration and deceleration must come from the person pushing. Once push mode is no longer needed, the brake release lever must be locked immediately.

NOTICE

Risk of damage due to improper preparation of maintenance tasks.
The Xeno power wheelchair must be turned off and the fuse must be removed for all maintenance tasks. This does not apply to functional tests of the electrical components.
- Secure the product to prevent it from tipping over or falling, e.g. off the workbench.
- Some components of the power wheelchair, e.g. the batteries, frame, seat and motors, are very heavy. Hoisting devices of sufficient capacity must be used where applicable.
- Clean / disinfect the product before you start the inspection. Consult the instructions for use regarding product care or product-specific inspection information.

NOTICE

Risk of damage due to unsecured screw connections. Unsecured screw connections can become loose while using the product. Secure screws and nuts. The screw connections must be tightened properly after all installation tasks. Defined torque specifications must be followed.
The screws and nuts for many of the screw connections are equipped with thread lock. If you have to undo such screw connections, the nuts or screws must be replaced with new ones equipped with thread lock. If new screws or nuts with thread lock are not available, apply a medium-strength liquid thread lock substance (such as Loctite® 241 or Euro Lock A24.20) to the existing screws.

NOTICE

Risk of upholstery damage. During any work on the seat, the upholstery must be adequately protected against mechanical and chemical damage. The back rest and seat bottom are flame retardant but nevertheless flammable. They must not come into contact with open flame or embers.

NOTICE

Risk of damage due to improper cleaning after the completion of maintenance tasks. The Xeno may not be cleaned with a jet of water or a pressure washer under any circumstances. A cloth or sponge may be used for cleaning. Water must not come into direct contact with the motor under any circumstances. Check the operating performance of the Xeno power wheelchair after cleaning.

INFORMATION

The tyres of the Xeno power wheelchair contain chemical substances that may react with other chemical substances (e.g. cleaning agents, acids, etc.).

2.5 Safety Instructions for Maintenance Works on Electrical Components

⚠ WARNING

Risk of acid burns caused by battery acid. Batteries must not be tilted, as this would allow very caustic battery acid to leak from the gas venting holes. Always wear protective gloves and safety glasses when working on the batteries. In case of contact with the skin or eyes, take the following first aid measures:
- After skin contact or splashes on clothes, immediately neutralise with acid converter or soap and rinse with plenty of water.
- After eye contact, immediately rinse the eye under running water for a few minutes, then consult a medical specialist immediately.
- After swallowing, consult a medical specialist immediately.

⚠ CAUTION

Risk of injury while working on the battery. Only use a battery charger supplied by Otto Bock which has been tested and approved for the respective batteries by Otto Bock (observe information on the charger). Failure to do so can result in a battery explosion and possible impairment of health due to contact with battery acid.
Smoking and open flame are prohibited while working on the battery. Sparks must be avoided.
Explosive gases can develop while the batteries are charging. Observe the safety information provided by the battery manufacturer. Wear protective goggles. Ensure sufficient ventilation when charging the batteries in an enclosed room.
Drive batteries can supply very large amounts of energy and may arc if they are short-circuited. Therefore, always disconnect the batteries when working on the motor control or wiring.

NOTICE

Risk of damage due to improper preparation of maintenance tasks.
If the driving function is not required, turn off the control unit or jack up the drive wheels in order to prevent uncontrolled operation through accidental joystick activation.
- Water must not come into direct contact with the electronics or battery during maintenance tasks.
- When attaching plug connections on the controller, ensure the contacts are assigned correctly.

NOTICE

Risk of battery damage. In order to prevent short circuits, always use insulated tools when working on the batteries.
Prevent deep discharge of the batteries in order to avoid loss of functionality and permanent battery damage.
Ensure correct polarity is used when connecting the batteries.

NOTICE

Risk of damage to the battery charger. Prevent overheating of the charger during the charging process. Ensure that the cooling ribs on the back of the device are not covered.

INFORMATION

The Xeno has been tested according to EMC regulations. The following particularities must be observed during operation and communicated to the user:

- The driving characteristics of the Xeno can be affected by electromagnetic fields (mobile phones or other radiating devices). Therefore all mobile devices must be turned off when driving.
- The Xeno can generate electromagnetic fields that can cause interference with other devices. Therefore, turn off the control unit whenever you do not need it.

INFORMATION

During extended periods of disuse or shipment of the XENO power wheelchair, remove the fuse from the battery case in order to prevent deep discharge of the batteries due to standby consumption.

2.6 Safety Instructions for Disposal

⚠ CAUTION

Risk of polluting the environment with battery acid. The batteries of the power wheelchair contain a toxic acid. They must not be disposed of with regular domestic waste and the battery acid must not enter the sewage water system or ground. The battery manufacturer's instructions printed on the batteries must be observed

INFORMATION

If the power wheelchair is no longer in use, it must be disposed of properly in accordance with national regulations.
If a wheelchair is to be disposed of, all components and materials of the power wheelchair must be recycled or disposed of properly.

2.7 Safety Instructions for Controller Configuration

⚠ WARNING

Risk of accidents and injury due to incorrect configuration settings. Modified parameter settings in the configuration can lead to changes in driving characteristics. In particular, changes to the speed, acceleration, braking or joystick settings can lead to unexpected and therefore uncontrollable operating performance with a risk of accidents. Always test the driving characteristics of the power wheelchair after configuration / programming is complete. Programming must only be completed by authorised personnel. Neither Otto Bock nor the control unit manufacturer are liable for damages (especially in combination with special controls) caused by programming that was not properly / professionally adapted to the abilities of the wheelchair user.

3 Transportation and Storage

The following environmental conditions apply to transportation and storage:

Ambient temperature -40 °C to +65 °C

3.1 Transportation

⚠ CAUTION

Risk of injury due to insufficient restraints. Secure the power wheelchair during transport in another vehicle sufficiently with tensioning straps.

NOTICE

Risk of damage due to falling. The maximum net weight of the power wheelchair is 140 kg. Hoisting devices and transportation vehicles used for transportation must have sufficient capacity.

NOTICE

Risk of damage due to improper transportation. Prior to folding down the backrest for transportation, lock both armrests in their swung-up position to prevent damage to the control panel.

The frame of the power wheelchair has two fixing eyebolts at the rear and two at the front for the attachment of the tensioning straps.

Figure 1 Rear eyebolts, front eyebolts

1 Eyebolts, rear
2 Eyebolts, front

Before transporting the power wheelchair, switch off the control unit and engage the brake.

The armrests can be swung up, the footplate flipped up and the backrest folded down to the front for transportation.

Figure 2 Swinging away the armrest

3.2 Flipping up the Footplate

1. Pull the locking bolt.
2. Flip the footplate up.

Figure 3 Release the footplate and flip it up

3.3 Folding the backrest down

⚠ CAUTION

Risk of pinching or crushing from improper locking of the backrest. When folding the backrest down, be sure that it does not fall back uncontrolled after pulling the cotter pin. Secure the backrest with one hand.

⚠ CAUTION

Risk of accidents and injury due to incorrect backrest assembly. Please note that it is imperative that cotter pin (double spring cotter) be mounted on the backrest adjustment mechanism after bringing the backrest in the upright position.

1. Flip the armrests up.
2. With one hand slide the back rest upwards.
3. Press the release knob and unhook the belt locking mechanism. Allow the backrest to lower.
4. Pull the cotter pin whilst supporting the backrest with one hand to prevent it from falling back uncontrolled.
5. Remove the mechanical or electric back angel adjustment from the holding device.

Figure 4 Press the release knob, pull the cotter pin, remove the back angle adjustment from the holding device.

6. Fold the backrest forwards.

Figure 5 Backrest folded forward

3.4 Storage

INFORMATION

If the power wheelchair is not moved for several days, permanent colour changes may occur where the wheelchair comes into contact with the surface it is standing on. Otto Bock therefore recommends parking the wheelchair on a suitable surface during extended periods of disuse.

The power wheelchair must be stored in an enclosed area. Remove the main fuse; otherwise, there is a risk of deep discharge.

The storage location must be dry and have sufficient air circulation. There must not be any build-up of humidity. The power wheelchair must not be subjected to any damaging exterior influences, e.g. rain, snow, or strong solar radiation during storage.

Otto Bock recommends storing the Xeno power wheelchair with slightly elevated tyre pressure and using assembly stands or wooden blocks in order to raise the tyres (completely) off the ground in order to protect them from frost. Regularly rotating the wheels helps to prevent flat spots.

4 Required Tools and Accessories

Suitable tools and accessories for the completion of service tasks are listed below:

- ❒ Flathead screwdriver, blade widths: 2,5/3,5/5,5 mm
- ❒ Phillips head screwdriver, size: 2
- ❒ Reversible ratchet handle wrench and sockets, sizes: 8 – 20
- ❒ Open-end or combination wrenches, sizes: 8 – 13
- ❒ Allen wrench, sizes 2 – 6
- ❒ Torque wrench
- ❒ Socket, size 19
- ❒ Puller
- ❒ Pin punch, Ø 3 mm
- ❒ Plastic hammer
- ❒ Tyre lever (bicycle repair kit)
- ❒ Inner tube repair kit
- ❒ Side cutting pliers
- ❒ Sharp knife
- ❒ Felt-tip pen
- ❒ Measured rule
- ❒ Liquid thread lock “medium strength”
- ❒ Handheld Programming Device
- ❒ Hoisting device of sufficient capacity

Figure 6 Tools

Figure 7 Handheld Programming Device

5 Information display

INFORMATION

Please see Section 7 for information on the display of error messages using the control panel display/ LCD monitor.

Messages are shown on the control panel display or LCD monitor:

Display symbol(s)	Display LCD	Information
		Driving menu with speed level and battery capacity
		Low battery capacity
		Charging process with drive lock
		Electric back adjustment
		Electric seat tilt
		Stand-up device
		Freely programmable functions (e. g. coupled electric seat tilt adjustment, backrest and seat tilt)
		Drive-away lock (System lock)

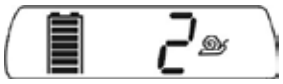
		Creep speed
		Attendant control

Table 1 Information displays

6 Service and Maintenance

6.1 Inspecting the General Condition

- ❒ Check all safety-related components for corrosion, repair if required and reapply corrosion protection.
- ❒ Check weld seams.
- ❒ Check tightness of screw connections; replace thread-locking compound if required; observe defined torque specifications; replace defective screws (e. g. in case of corrosion).
- ❒ Check cables for ruptures, signs of wear and proper attachment; replace defective components.
- ❒ Check cable connections and plug connections.

6.2 Fuse replacement

The 80 A fuse is located in a fuse holder at the rear end of the battery case.

Preparation:

- ❒ OWithout lighting: Pull the battery case out to the rear and remove the cover.
- ❒ With lighting: Pull the battery case out to the rear and remove the cover plate (see Section 6.3.2).
- ❒ Turn the control unit off.

Steps:

1. Open the cap of the fuse holder.
2. Pull out the fuse and replace if required.
3. When inserting the fuse, make sure that it is pressed into the centre of the spring contacts and that it is not seated at an angle.
4. Close the cover. You should feel the cover lock in place.

Properly reassemble all components upon completion of the work.

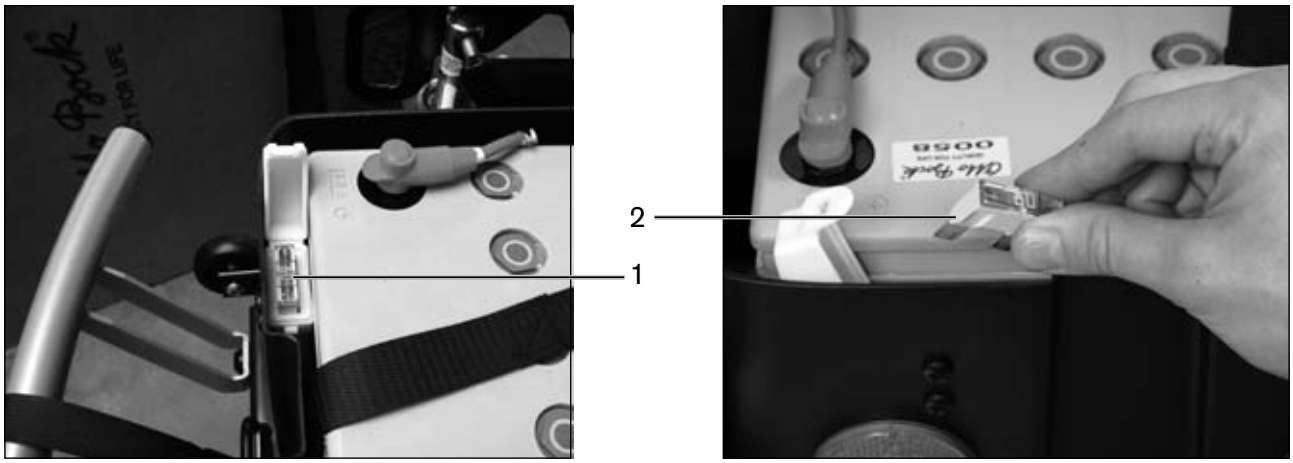


Figure 8 Replacing the fuse, pulling the fuse out

1 Fuse housing with open cover and inserted fuse
2 Fuse, pulled out

6.3 Batteries

⚠ CAUTION

Risk of injury while working on the battery. Smoking and open flame are prohibited while working on the battery. Sparks must be avoided.
Explosive gases can develop while the batteries are charging. Observe the safety information provided by the battery manufacturer. Wear protective goggles. Ensure sufficient ventilation when charging the batteries in an enclosed room.
Drive batteries can supply very large amounts of energy and may arc if they are short-circuited. Therefore, always disconnect the batteries when working on the motor control or wiring.

⚠ CAUTION

Risk of polluting the environment with battery acid. The batteries of the power wheelchair contain a toxic acid. They must not be disposed of with regular domestic waste and the battery acid must not enter the sewage water system or ground. The battery manufacturer's instructions printed on the batteries must be observed.

NOTICE

Risk of battery damage. In order to prevent short circuits, always use insulated tools when working on the batteries. Prevent deep discharge of the batteries in order to avoid loss of functionality and permanent battery damage. Ensure correct polarity is used when connecting the batteries and battery capacity meter.

INFORMATION

The batteries are located in a battery case under the seat of the power wheelchair.
On models with lighting, the top of the case is open. In this case, there is a cover underneath the seat, which is screwed to the frame. When performing certain maintenance tasks on the batteries and their feed lines, it is necessary to move the seat to the standing position and remove the cover.
On power wheelchairs without lighting, the battery case has a cover that is secured with a belt.

The standard version of the Xeno power wheelchair is equipped with two 12 V lead acid batteries with a capacity of 60 Ah. During the charging process, the water-acid mixture rapidly turns into gas. The Xeno power wheelchair may be equipped with two gel batteries with a capacity of 63 Ah as an option.

6.3.1 Charge the batteries

⚠ WARNING

Risk of injury due to incorrect charging profile adjustment. When switching from wet cell to gel batteries, changing the charging profile on the charger is mandatory (see notice on the charger).

⚠ WARNING

Risk of injury due to explosive gases. Explosive gases can develop while the batteries are charging. The following safety instructions must be followed under all circumstances:
- Ensure sufficient ventilation when charging the batteries in closed rooms.
- Smoking and fire are not permitted.
- Sparks must be avoided.
- Do not cover the air vents in the trim.

⚠ WARNING

Explosion hazard due to sparks. Always switch off the battery charger and remove the mains plug before disconnecting the battery.

NOTICE

Risk of battery damage. Ensure correct polarity is used when connecting the battery charger to the batteries.

NOTICE

Risk of damage due to incorrect battery handling. Please note the following when handling the batteries:
- Charge the batteries immediately if the bar at the bottom of the battery indicator is flashing.
- Do not charge in the green range.
- During extended periods of disuse, charge the batteries of the Xeno power wheelchair weekly.
- Otto Bock assumes no liability for damage caused by deep discharge.

NOTICE

Risk of damage to the battery charger / risk of damage caused by the battery charger. Please note the following when using the charger:
- Only use a battery charger supplied by Otto Bock which has been tested and approved for the respective batteries used by Otto Bock (observe information on the charger). Failure to do so can result in a battery explosion and possible impairment of health due to contact with battery acid.
- The information on the nameplate of the charger must match the country-specific voltage of the respective power supply network.
- Only use the battery charger within the specified ranges of temperature and humidity.
- Place the rubber feet of the battery charger on a level surface.
- When setting the charger up close to a window, protect it against direct sunlight.
- Keep the charger from overheating. The vent openings on the back of the charger must not be covered.

- Turn off the control unit during the charging process so that the entire charging current flows to the battery.
- Avoid dust and dirt. Only clean with a dry cloth.

The remaining battery capacity determines the range of the power wheelchair. The following factors affect the battery capacity:

❒ Ambient temperature

❒ Age of the batteries

❒ Amount of use

❒ Charging process

Driving for an extended period of time in the lower range of the battery indicator will result in deep discharge and therefore battery damage. In addition, there is the risk that the power wheelchair may stop due to zero battery capacity and put the user in a dangerous situation.

Tools:

❒ Charger intended for use by Otto Bock.

Steps:

1. Turn off the control unit on the power wheelchair.
2. Open the charging receptacle cover.
3. Insert the charger plug into the charging receptacle.
4. Connect the charger to the power supply network and switch it on.
   Charging starts automatically.
5. When the charging process is complete, turn off the battery charger:
6. Disconnect the apparatus from the mains supply.
7. Disconnect the charging plug.
8. Close the charging receptacle cover.
9. Turn on the control unit on the power wheelchair.
   The power wheelchair is again ready for driving.

Figure 9 Charging receptacle

1 Charging receptacle
2 Hinged flap

Figure 10 Otto Bock battery charger

The battery charger features a programmed recharging phase. Once a discharged battery is completely charged (after approximately 8 hours), the battery charger can remain connected with no risk of overcharging or damaging the battery.

The battery charger indicates the following states:

Anzeige		Funktion
Green LED flashes	1 x 2 x Steady	Low-maintenance battery Maintenance-free battery Battery is charged to 80 %
Yellow LED is lit		Battery is charging
Green LED is illuminated		Battery is fully charged
Red LED is illuminated		Battery is defective or missing, or charging time has been exceeded

Table 2 Battery charging statuses during the charging process

6.3.2 **Removing the Cover** (on Models with Lighting)

Preparation:

❒ Move the seat to the standing position.

❒ Turn the control unit off.

Tools:

❒ Allen wrench, size 4

Steps:

1. Loosen the two Allen head screws.
2. Remove the cover plate.

Properly reassemble all components upon completion of the work.

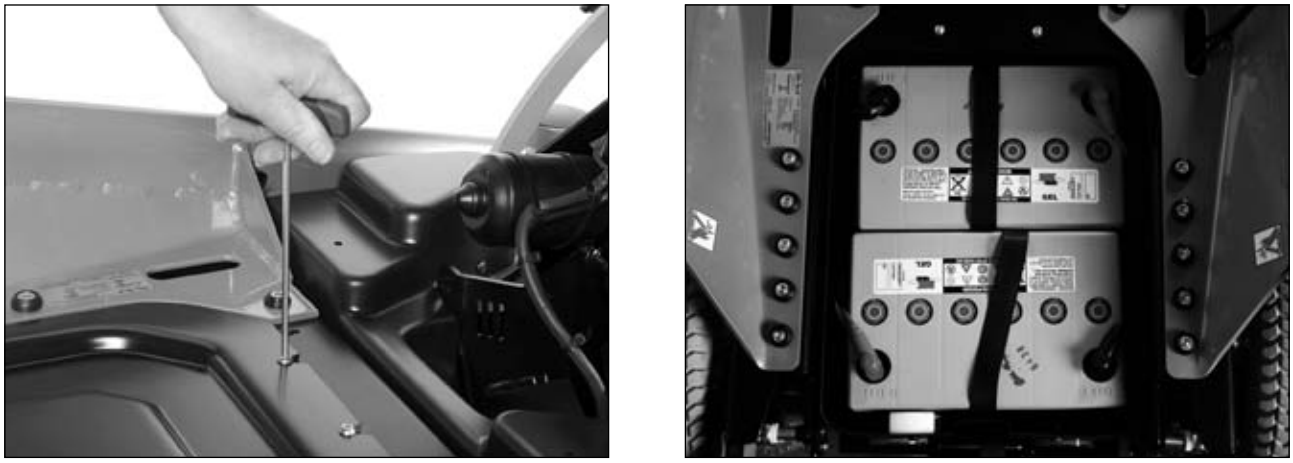


Figure 11 Removing the cover, batteries in battery case

6.3.3 Replacing the batteries

⚠ CAUTION

Risk of injury due to electric current. Always remove the main fuse before doing any work on the batteries.

NOTICE

Risk of battery damage. Ensure correct polarity is used when connecting the batteries.

Tools:

❒ Open-end or combination wrench, size 11

❒ Flathead screwdriver, wide

Steps:

1. Unlock the battery case and pull it out to the rear.

Figure 12 Unlock the battery case and pull it out

2. Remove the cover (on models without lighting)
3. Pull out the fuse (see Section 6.2).
4. Disconnect all battery cables.

Figure 13 Disconnect cables

5. Lift out the batteries by the handles and replace if required.

Properly reassemble all components upon completion of the work.

Figure 14 Release mechanism engaged

6.3.4 Checking and Topping Up the Fluid Level (Only for Lead-Acid Batteries)

INFORMATION

Check the fluid level in the battery and top it up if required.

Preparation:

❒ Turn the control unit off.

❒ Remove the batteries (see Section 6.3.3).

Tools:

❒ Flathead screwdriver, wide

Steps:

1. Place the batteries on a level surface.
2. The fluid level is visible from the outside. Compare it against the “Min” and “Max” labels on the front and rear of the batteries.
3. If the fluid level is too low, open the cover of the corresponding cell.
4. Add distilled water until the fluid level is between the “Min” and “Max” labels.

Properly reassemble all components upon completion of the work.

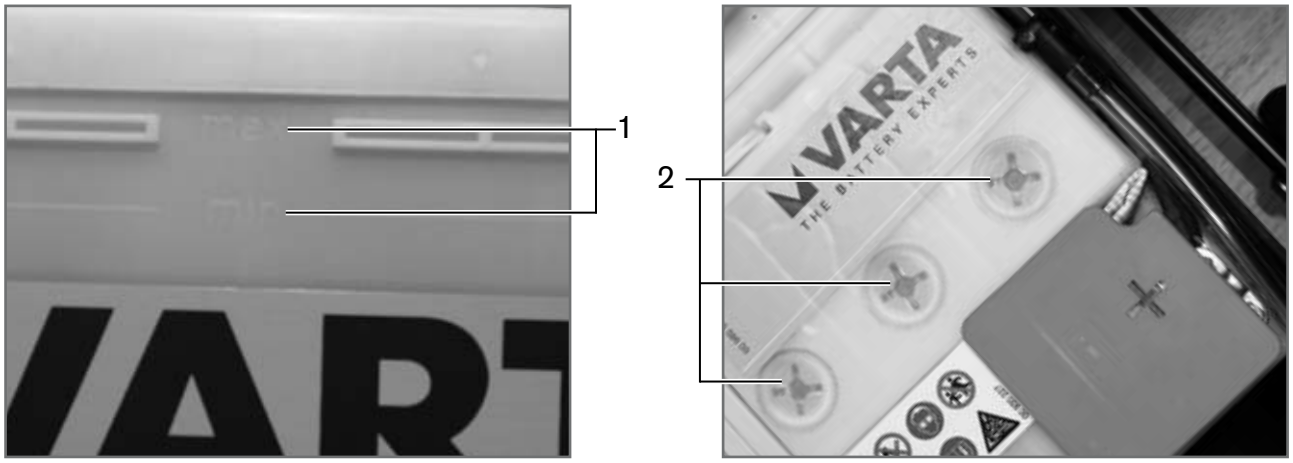


Figure 15 Fluid level indicators, battery cell

1 Min-max labels for the fluid level
2 Cover of an individual battery cell

6.3.5 Removing the Battery Case

Preparation:

❒ Remove the batteries (see Section 6.3.3).

Steps:

1. Remove the battery case and replace if required.

Properly reassemble all components upon completion of the work.

6.3.6 Reinstalling the Battery Cable

NOTICE

Risk of battery damage. Ensure correct polarity is used when connecting the batteries.

Preparation:

❒ Remove the batteries (see Section 6.3.3).

Tools:

❒ Allen wrench, size 5 mm

Steps:

1. Loosen the four Allen head screws.
2. Flip back the attachment plate with the controller and seat module (see Section 6.4).
3. Remove cable ties.
4. Loosen the battery cable connection to the controller.
5. Remove the battery cable and replace, if required.

Properly reassemble all components upon completion of the work.

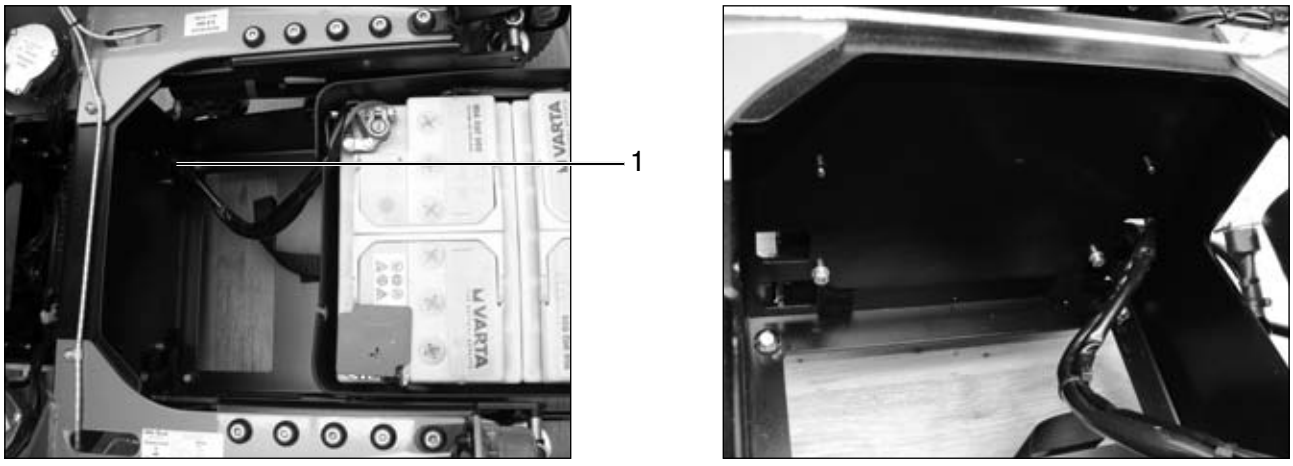


Figure 16 Battery cable

1 Battery cable connector

6.3.7 Installing New Battery Vent Hoses (Only for Lead-Acid Batteries)

NOTICE

Risk of battery damage. Ensure correct polarity is used when connecting the batteries.

Preparation:

❒ Remove the batteries (see Section 6.3.3).

Tools:

❒ Open-end or combination wrench, size 11

Steps:

1. Route the battery vent hose through the hole at the rear of the battery case.
2. Insert the battery.
3. Connect the vent hose at the proper location on the battery.

Properly reassemble all components upon completion of the work.

Figure 17 Vent hoses

6.3.8 Replacing the Charging Receptacle

Preparation:

❒ Move the seat to the standing position.

❒ Make the batteries freely accessible.

❒ Pull out the fuse (see Section 6.2).

❒ Disconnect the charging receptacle connecting cable from the controller.

Tools:

❒ Allen wrench, size 3

❒ Small Phillips screwdriver

Steps:

1. Loosen the three Allen head screws on the cover and remove the cover from the charging receptacle.
2. Loosen the two Phillips head screws on the charging receptacle.
3. Pull the charging receptacle with the connecting cable out to the front and replace.

Properly reassemble all components upon completion of the work.

Figure 18 Removing the charging receptacle

6.4 Replacing the Controller/Seat Module

INFORMATION

When connecting the cables, ensure correct assignment.

INFORMATION

For information on connecting the controller/seat module, please see Sections 8.2 and 8.3.

Preparation:

❒ Move the seat to the standing position.

❒ Pull out the fuse (see Section 6.2).

Tools:

❒ Allen wrench, sizes 2, 3, 5 mm

❒ Open-end or combination wrench, size 7

Steps:

1. Pull out the battery case.
2. Loosen the four Allen head screws on the holding plate.

Figure 19 Loosen the Allen head screws on the holding plate

3. Flip back the attachment plate with the controller and seat module.

Figure 20 Flip the holding plate with the controller + seat module to the rear

4. Remove all connectors on the seat module.
5. Loosen the two set screws on the controller/seat module.

Figure 21 Loosen the controller and seat module

6. Remove all connectors on the controller.
7. Remove the controller/seat module and replace if required.

Properly reassemble all components upon completion of the work.

6.5 Wheels

⚠ CAUTION

Risk of injury due to worn or defective tyres. Replace wheels with PU tyres if the material is cracking or damaged, or when the tread becomes worn down to such an extent that there is only 5 mm of radius left on the outer edges of the tyre.
Replace the casing of pneumatic tyres if it is bald or shows signs of cracking or other damage.

The Xeno power wheelchair is propelled by two 14" drive wheels. Standard configuration for steering is by means of two 9" front steering casters.

6.5.1 Inspecting the General Condition

INFORMATION

Direct sunlight/UV light causes the tyres to age prematurely. As a result, the tread surface hardens and corner pieces break out of the tread.

INFORMATION

Avoid parking the wheelchair outdoors whenever possible. Regardless of wear and tear, the tyres should be replaced every 2 years.
If the wheelchair is parked for an extended period of time or the tyres overheat (e.g. in the vicinity of radiators or in case of exposure to strong sunlight behind glass), the tyres may become permanently deformed. Therefore, sufficient clearance should always be maintained from sources of heat, and the power wheelchair should be moved frequently or placed on blocks for storage.

Steps:

1. Verify the tyre condition in regards to tread, porosity and cracking.

6.5.2 Removing the drive wheel

NOTICE

Risk of damage due to improper preparation of maintenance tasks. Use suitable objects such as wooden blocks to secure the power wheelchair against sliding or tipping. The drive wheels must rotate freely.

Preparation:

❒ Turn off the control unit.

Tools:

❒ Allen wrench, size 5 mm

❒ Torque wrench

Steps:

1. Jack the power wheelchair up until the wheel to be changed rotates freely.
2. Loosen the four Allen head screws around the wheel hub.
3. Pull the drive wheel forward off the wheel hub.

Properly reassemble all components upon completion of the work.

INFORMATION

When installing the wheel, tighten all four screws to a torque of **25 Nm**.

Figure 22 Disassembling drive wheel

6.5.3 Removing the steering caster

NOTICE

Risk of damage due to improper preparation of maintenance tasks. Use suitable objects such as wooden blocks to secure the power wheelchair against sliding or tipping. The drive wheels must rotate freely.

INFORMATION

When installing the steering caster, ensure that the steering caster and drive wheel are aligned.

Preparation:

❒ Turn off the control unit.

Tools:

❒ Allen wrench, size 5 mm

❒ Torque wrench

Steps:

1. Jack the power wheelchair up until the wheel to be changed rotates freely.
2. Loosen the Allen head screw in the middle of the wheel.
3. Remove the caster wheel from the front wheel fork.

Properly reassemble all components upon completion of the work.

Figure 23 Disassembling the caster wheel

6.5.4 Changing Tyres

Preparation:

❒ Remove the drive wheel (see Section 6.5.2).

Tools:

❒ Tyre lever (bicycle repair kit)

Steps:

1. Let all the air out of the tyre.
2. Using the tyre lever, remove the casing from the wheel rim and replace if required.

Properly reassemble all components upon completion of the work.

6.5.5 Replacing the Casing or Inner Tube of Pneumatic Tyres

The wheel rims are in two parts and can be separated by removing the Allen head screws.

Preparation:

❒ Remove the wheel to be replaced (see Sections 6.5.2, 6.5.3).

Tools:

❒ Tyre lever (bicycle repair kit)
❒ Inner tube repair kit
❒ Allen wrench, size 6 mm

Steps:

1. Let all the air out of the tyre.
2. Loosen all five Allen head screws.
3. Separate the two pieces of the rim.
4. Pry back the casing from the edges of the rim.
5. Push the valve completely through to the inside of the rim and pull out the tube.

6. Replace the tube or repair it with a conventional bicycle tube repair kit.

Properly reassemble all components upon completion of the work.

Figure 24 Removing the casing

6.5.6 Replacing the Drive Wheel Flange

Preparation:

❒ Remove the drive wheel (see Section 6.5.2).

Tools:

❒ Socket, size 19

❒ Puller

Steps:

1. Loosen the screw.
2. Use the puller to remove the wheel flange and replace if required.

Properly reassemble all components upon completion of the work.

INFORMATION

When installing the wheel, tighten all four screws to a torque of 25 Nm.

Figure 25 Wheel flange screw, put puller in place

6.5.7 Removing the Drive Wheel Spring or Changing the Coefficient

NOTICE

Risk of damage due to improper preparation of maintenance tasks. Use suitable objects such as wooden blocks to secure the power wheelchair against sliding or tipping. The drive wheels must rotate freely.

The drive wheel springs are attached at two points: At the top of the drive unit sustainer and on the oscillating crank.

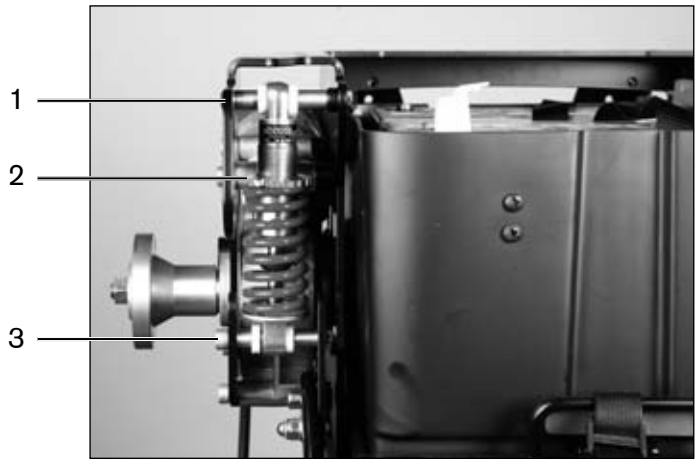


Figure 26 Parts of the drive wheel spring

1 Upper screw connection
2 Coefficient set plate
3 Lower screw connection

Preparation:

❒ Remove the drive wheel (see Section 6.5.2).

Tools:

❒ Allen wrench, size 5 mm

❒ Allen wrench, size 6 mm

❒ Ring wrench or open-end wrench, size 13 mm

Steps:

1. Loosen both Allen head screws holding the drive wheel spring and remove the drive wheel spring.
2. Install a new drive wheel spring if required, or change the coefficient (turn the upper plate up or down by hand):
   a. Turn to the left: Greater spring tension.
   b. Turn to the right: Less spring tension.

INFORMATION

Make sure that both springs are adjusted equally! The factory default setting is **60 mm** from the spindle to the spring plate.

Properly reassemble all components upon completion of the work.

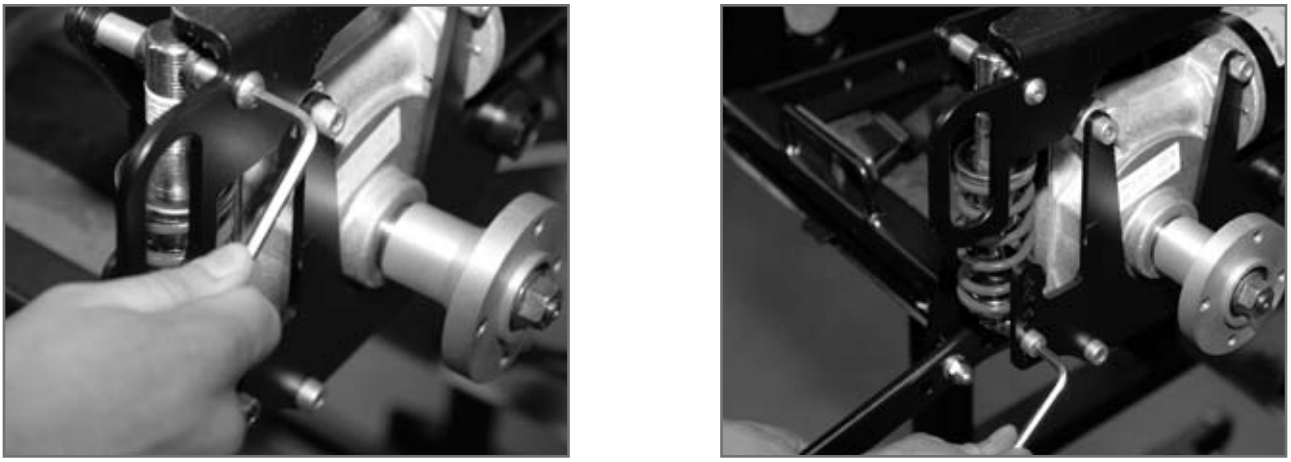


Figure 27 Removing the drive wheel spring

6.5.8 Replacing the Steering Potentiometer

Tools:

❒ Allen wrench, size 2,5

Steps:

1. Disconnect the steering potentiometer connecting cable from the controller.
2. Remove the steering potentiometer cover.

Figure 28 Removing the cover

3. Loosen the two Allen head screws.

Figure 29 Loosening the steering potentiometer screw connection

4. Pull the steering potentiometer including the connection cable up and out and replace if required.

Figure 30 Steering potentiometer removed

Properly reassemble all components upon completion of the work.

6.5.9 Removing the Steering Drive

NOTICE

When installing the new chain, only tighten the chain tensioner on the interior side.

INFORMATION

Only the steering motor tolerance is transferred via the chain.

The drive motor for the steering and the chain drive together form a unit that can only be replaced as a whole if necessary.

Preparation:

❒ Move the wheelchair to the standing position.

❒ Remove the caster (see Section 6.5.3).

❒ Remove the steering potentiometer (see Section 6.5.8).

Tools:

❒ Allen wrenches, sizes 2.5, 4, 5 mm

❒ Small Phillips screwdriver

❒ Socket, size 19

Steps:

1. Loosen the two Allen head screws on the cover.

Figure 31. Loosen the Allen head screws on the cover

2. Remove the cover
3. Loosen the four Phillips head screws on the chain guard (two on the inside, two on the outside).

Figure 32 Loosen the Phillips head screws on the chain guard

4. Loosen and remove the Allen head screw on the chain tensioner.

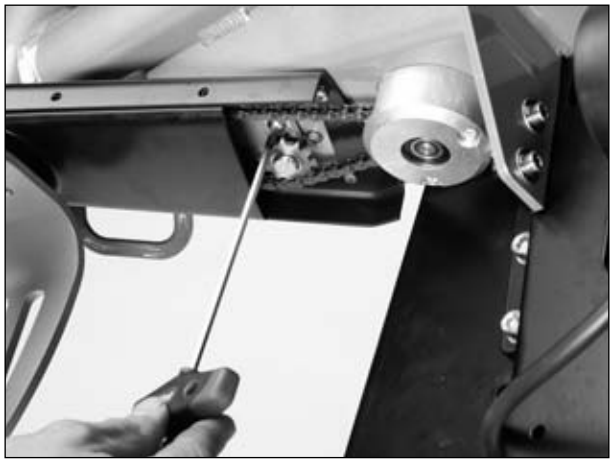


Figure 33 Loosen the chain tensioner

5. Loosen the two Allen head screws on the bearing housing and remove it.

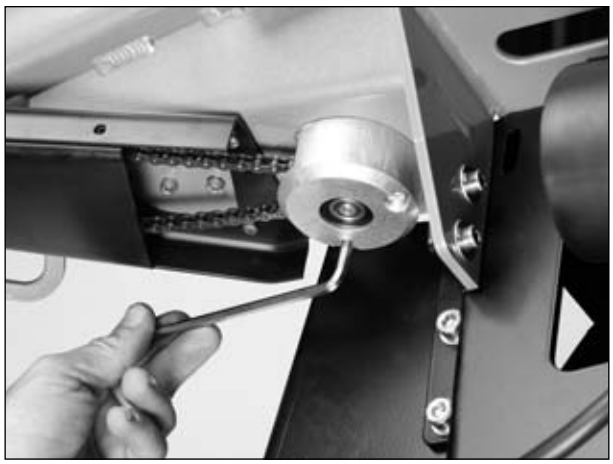


Figure 34 Removing the bearing housing

6. Turn the fork until the sprocket wheel and bearing disconnect.
7. Support the sprocket wheel and bearing, as they will both fall out the bottom.

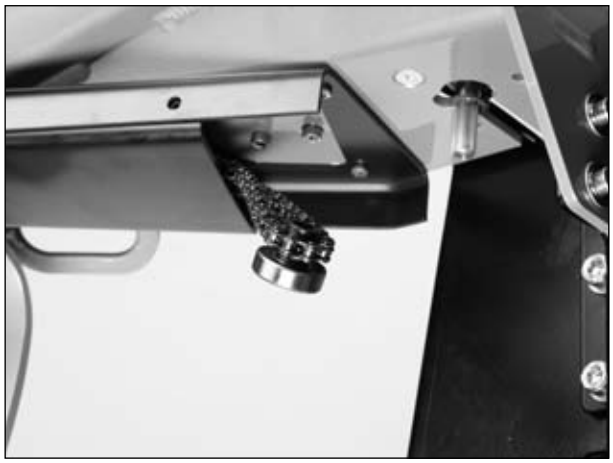


Figure 35 Disconnected sprocket wheel and bearing

8. Disassemble the caster fork.

Figure 36 Disassemble the caster fork

9. Remove the caster fork, including the chain and chain guard.

Figure 37 Remove the caster fork, chain and chain guard

Properly reassemble all components upon completion of the work.

6.5.10 Mounting Splash Guards for Drive Wheels (optional)

NOTICE

Risk of damage due to improper preparation of maintenance tasks. Use suitable objects such as wooden blocks to secure the power wheelchair against sliding or tipping. The drive wheels must rotate freely.

Each drive wheel has a splash guard consisting of a holding plate with 3 holes and the actual splash guard made of plastic. The splash guard is attached to the motor mount.

Preparation:

❒ Remove the drive wheels (see Section 6.5.2).

Tools:

❒ Allen wrenches, sizes 4, 6 mm

❒ Ring wrench or open-end wrench, size 10 mm

Steps:

1. Screw the holding plate and plastic splash guard together (middle hole on the holding plate).
2. Loosen the two screws on the motor mount.
3. Place the splash guard against the motor mount so that the holes in the holding plate align with those on the motor mount.
4. Attach the splash guard to the motor mount with two screws.

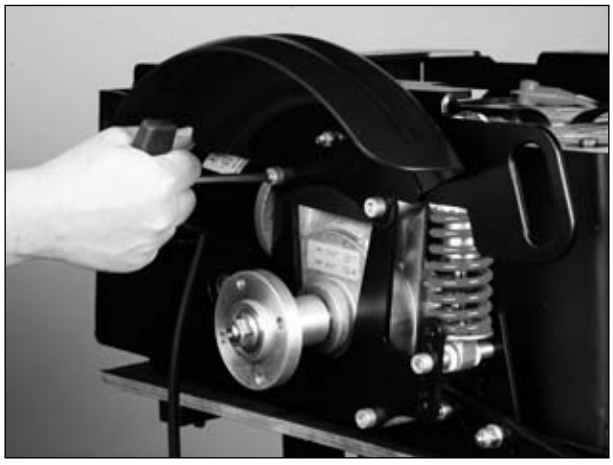


Figure 38 Installing the splash guard for drive wheels

6.6 Brakes and Brake Release

Both drive motors of the Xeno power wheelchair are braked simultaneously by the control unit via a motor brake. In the event of defects in the brake unit, the drive motor and motor brake are replaced entirely.

6.6.1 Replacing the wheel lock release

⚠ CAUTION

Risk of accidents and injury due to rolling. Before working on the brake release, turn off the power wheelchair. Secure the Xeno power wheelchair so it cannot roll away.

INFORMATION

Only mount the brake release while it is unlocked.
When the joystick is activated while the brakes are unlocked, the control system emits an error signal on the control panel. If this is not the case, there is a malfunction that must be corrected immediately.

Depending on user preferences, the brake release is located on the frame at the front to the right or left under the seat.

Tools:

❒ Allen wrench, size 4

Steps:

1. Loosen the Bowden cables on the drive motors.

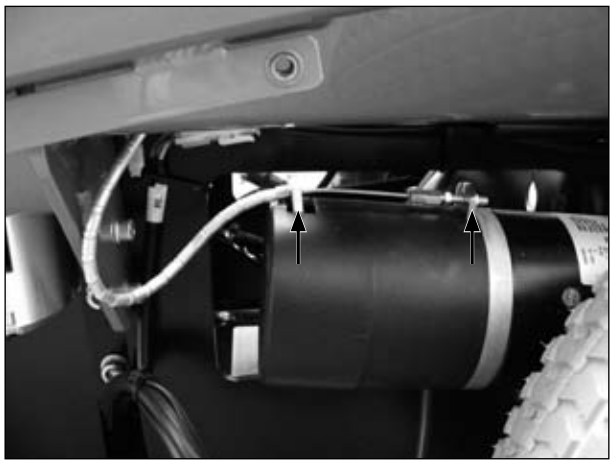


Figure 39 Attachment of Bowden cable to drive motor

2. Loosen the two Allen head screw on the inside of the frame.

Figure 40 Loosen the holding device with the brake release

3. Remove the wheel brake including the Bowden cables and replace if required.

Properly reassemble all components upon completion of the work.

6.6.2 Setting/Adjusting the Brake Release

The Bowden cables are normally adjusted on the brake release housing. If the correct setting cannot be obtained by means of the adjustment screw, the threaded rod on the other end of the Bowden cable can be moved by approximately 5 – 8 mm on the drive motor side. Subsequently, the brake release must be completely readjusted. When making adjustments for the first time (e.g. cable replacement), the Bowden cable should have very little play before adjusting it.

Tools:

❒ 2 open-end or combination wrenches, size 7, to establish the setting

❒ 2 open-end or combination wrenches, size 8, to make adjustments

INFORMATION

Lock the adjustment screw every time the setting is changed. Otto Bock recommends making adjustments in small increments (½ turn).

a) Adjusting an over-tightened Bowden cable

Steps:

1. Loosen the M5 counter nut (SW 8) and turn the adjustment screw clockwise on the brake release housing.
2. Commence functionality check from the beginning.

b) Adjusting a slack Bowden cable

Steps:

1. Loosen the M5 counter nut (SW 8) and turn the adjustment screw counter-clockwise on the brake release housing.
2. Commence functionality check from the beginning.

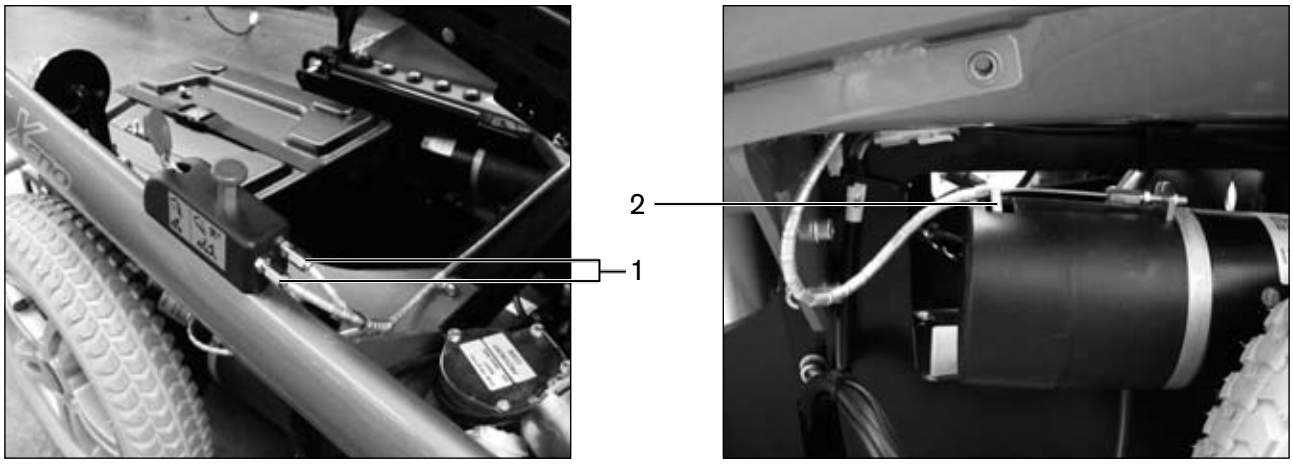


Figure 41 Adjusting the Bowden cable

1 Adjustment screws on the brake release housing
2 Threaded rod for readjusting the drive motor

6.6.3 Brake Settings

⚠ CAUTION

Risk of accidents and injury due to lack of brake functionality. Incorrect brake settings can lead to a loss of braking power. Repairs and settings must only be made by authorised personnel. Replace damaged Bowden cables with new ones immediately.

Correct brake settings are essential for driving. This is why Otto Bock recommends inspecting the brake every three months.

To avoid excessive friction, the radius of the Bowden cable must not be less than 10 cm.

Damaged Bowden cables must be replaced immediately, for example if individual wires are protruding or there is a kink in the black sheath.

6.6.4 Performing a function check of the brake settings

During the functional test of the brake settings, please observe the following points and complete the tasks described below:

Steps:

3. Lock the release lever in position 1.
4. While driving straight forward at approximately 6 km/h, release the joystick in its front-most position.
5. If the wheelchair maintains its current direction during the delay, repeat the test on a slope of 10% unless this is limited by information on the nameplate.
6. If the power wheelchair leaves the current direction, adjust the Bowden cable for the opposite side. The adjustment process is described in Section 6.6.2 under “Adjusting an over-tightened Bowden cable”.

7. If the power wheelchair tracks properly in both cases, conduct the following test on an even surface:
   a. Pull the release bolt on the brake housing. The lever automatically moves forward into position 2. You should not be able to push the power wheelchair with the lever in this position. If the drive wheels do not lock, loosen the Bowden cable for the side with the wheel that still rotates by ½ turn (see Section 6.6.2 under “Adjusting an over-tightened Bowden cable”).
   b. Turn the lever to position 3. The power wheelchair can be pushed easily, even when turning. If the power wheelchair pulls to one side, tighten the Bowden cable on the corresponding side. The adjustment process is described in Section 6.6.2 under “Adjusting a slack Bowden cable”.
8. If no deviations are found during the tests described above, no readjustment is necessary.

6.7 Anti-tipper

6.7.1 Removing the anti-tipper support

Tools:

❒ Allen wrench, size 5 mm

❒ Allen wrench, size 6 mm

❒ Ring wrench or open-end wrench, size 13 mm

Steps:

1. Loosen the rear Allen head screw.
2. Loosen the front Allen head screw.
3. Remove the anti-tipper support and replace if required.

Properly reassemble all components upon completion of the work.

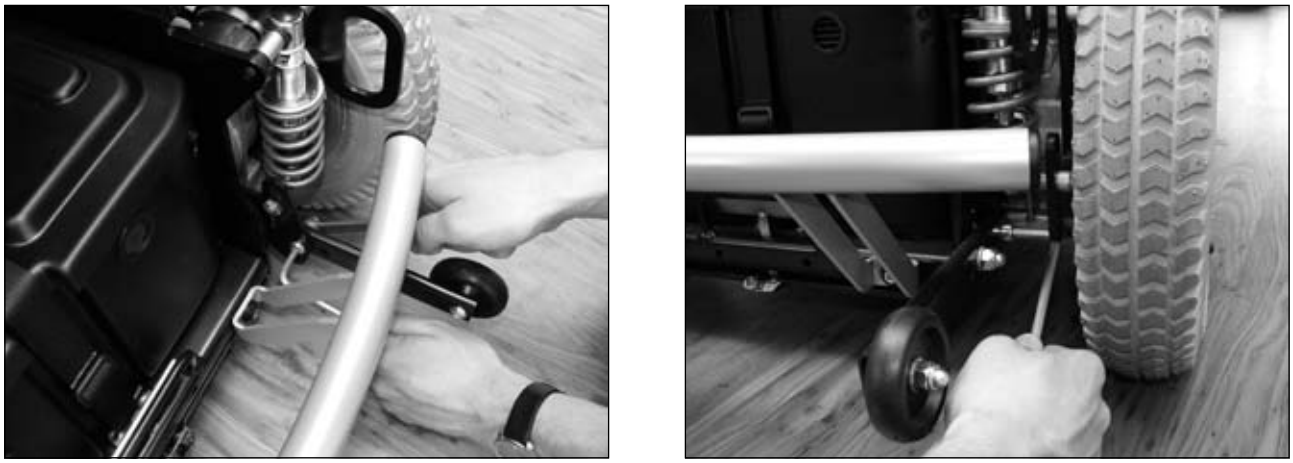


Figure 42 Removing the anti-tipper support

6.7.2 Removing the anti-tipper wheel

Tools:

❒ Allen wrench, size 5 mm

❒ Ring wrench or open-end wrench, size 13 mm

Steps:

1. Loosen the Allen head screw.
2. Remove the wheel and replace if required.

Properly reassemble all components upon completion of the work.

Figure 43 Removing the anti-tipper wheel

6.8 Lighting

The Xeno power wheelchair can be equipped with optional front and rear lights. The lighting function is controlled using the controller. The lighting is connected to the controller underneath the seat (see Section 8.2 for connections). The controller is pre-programmed. It can be adapted to the respective lighting system by programming it using the handheld programming device (see Section 8.4).

6.8.1 Front lights

INFORMATION

Ensure the protective pane is properly positioned in the housing during installation. Tighten the screws for the protective pane thoroughly so that moisture cannot penetrate the lamp.

Assembly

Tools:

❒ Allen wrench, size 4

Steps:

1. Hold the front lights mounting kit in place on the chassis.
2. Attach with two Allen head screws.
3. Feed the connection cable to the plug and connect.

Figure 44 Front-mounted lighting

Replacing defective lamps

Tools:

❒ Allen wrench, size 3

❒ Flathead screwdriver, small

Steps:

1. Fold the halogen lamp with cover forward by pressing the black locking lever on the bottom of the lamp.
2. Pull the retaining ring back.
3. Pull the halogen lamp back, remove it and replace if required.
4. Properly reassemble all components upon completion of the work.

INFORMATION

During installation, ensure that the notch on the halogen lamp socket is positioned correctly and engages.

Figure 45 Replacing the front halogen lamp

Replacing the direction indicator lamp

Steps:

1. Slightly press into the recess at the top of the housing until the lug disengages.
2. Fold down the cover.
3. Turn the bulb counter-clockwise by one-quarter turn and remove it.

Properly reassemble all components upon completion of the work.

NOTICE

Risk of direction indicator lamp damage. Do not touch the direction indicator lamp directly with your fingers during installation. When the lamp heats up, grease on the surface may cause the direction indicator lamp to burst. Use gloves or a cloth during installation.

INFORMATION

During installation, ensure that the lug on the bulb engages in the notch on the socket.

Figure 46 Replacing the front direction indicator

6.8.2 Rear Lights

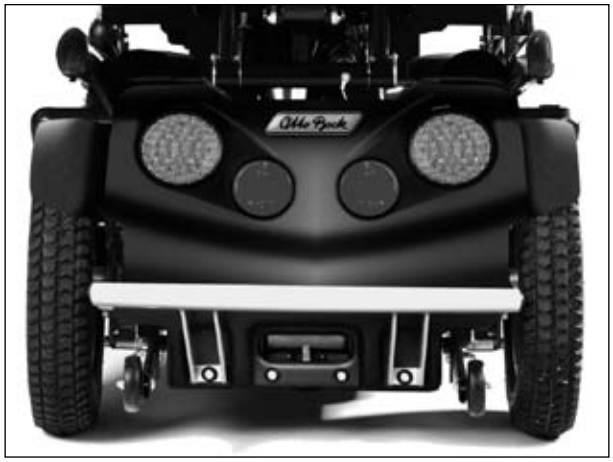


Figure 47 Rear Lights

The rear lights can only be replaced as a whole.

1. Pull out the battery case.
2. Separate the electric feed line from the connector plug.
3. Loosen the screw connections and remove the rear lights.

Properly reassemble all components upon completion of the work.

Figure 48 Removing the rear lights

6.9 Registered office

⚠ CAUTION

Risk of burns in the proximity of fire. The back rest, seat bottom and supports of the XENO power wheelchair are flame retardant but nevertheless flammable. Therefore utmost caution is required near any sources of open flame or sparks, especially lit cigarettes.

NOTICE

Risk of damage to upholstery. During any work on the seat, the upholstery must be adequately protected against mechanical and chemical damage.

6.9.1 Removing the Seat Cushion and Back Padding

The seat cushion and back padding are attached to the seat and back plates with two hook-and-loop closures and can simply be pulled away.

6.9.2 Changing the backrest height setting

NOTICE

Risk of cable damage. Ensure the cables attached to the frame with cable ties are not damaged.

Preparation:

❒ Remove the backrest cushion from the back plate (see Section 6.9.1).

Tools:

❒ Ring wrench or open-end wrench, size 10 mm

Steps:

1. Loosen the four Allen head screws on the back side of the back plate.
2. Slide the back plate along the slotted holes to set the height.

Properly reassemble all components upon completion of the work.

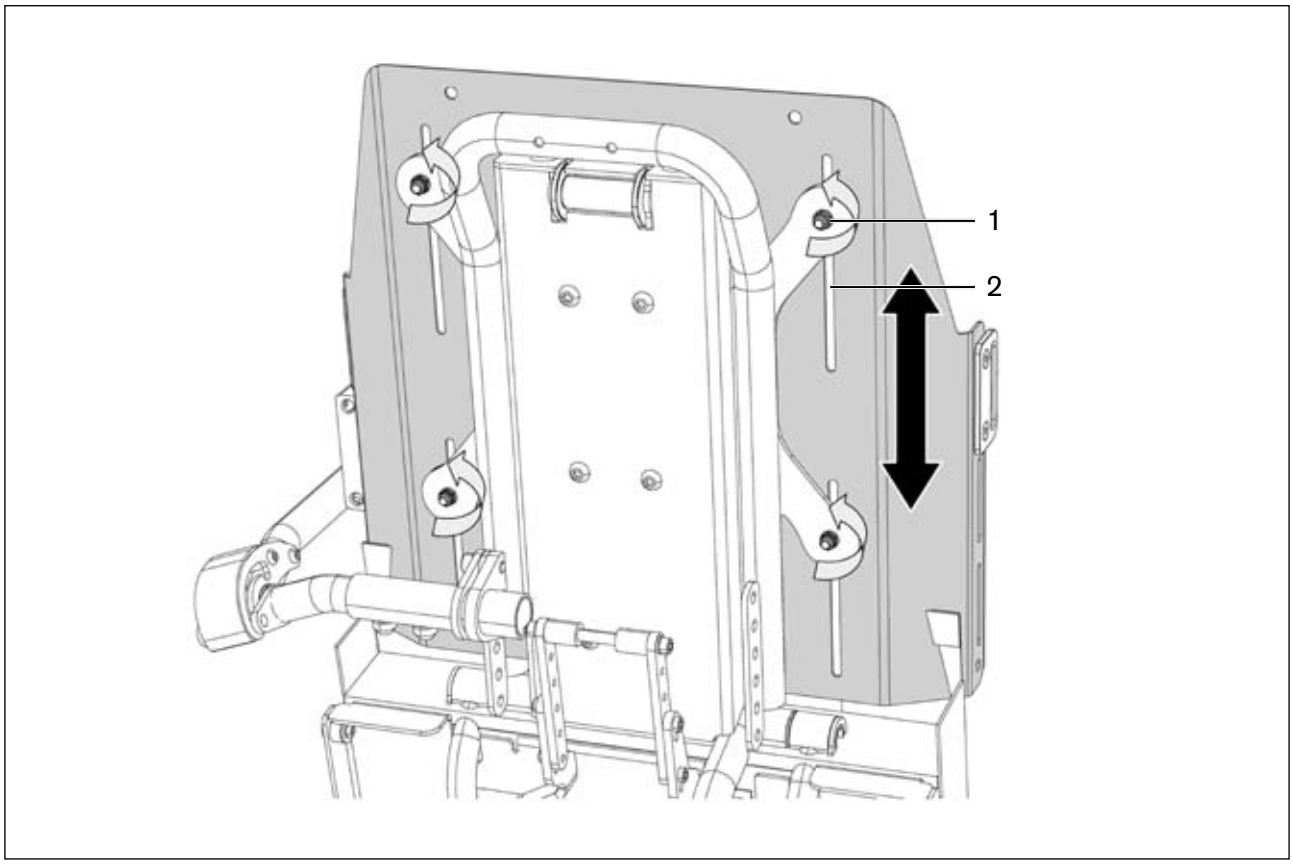


Figure 49 Changing the backrest height setting

1 Allen head screws
2 Slotted hole

6.9.3 Adjusting the Back Compensation

NOTICE

Risk of cable damage. Ensure the cables attached to the frame with cable ties are not damaged.

INFORMATION

The back compensation can be adjusted in increments of **10 mm**.

Preparation:

❒ Move the seat into the standing position until the screws are freely accessible.

❒ Push up the back rest by hand, press the unlock button and release the belt lock; then lower the back rest (see Section 3.3).

Tools:

❒ 2 x Allen wrench, size 5

Steps:

1. Loosen and remove the four Allen head screws.
2. Position the mounting plates with lateral eyelet according to the bores, using the values specified in Table 3.

Properly reassemble all components upon completion of the work.

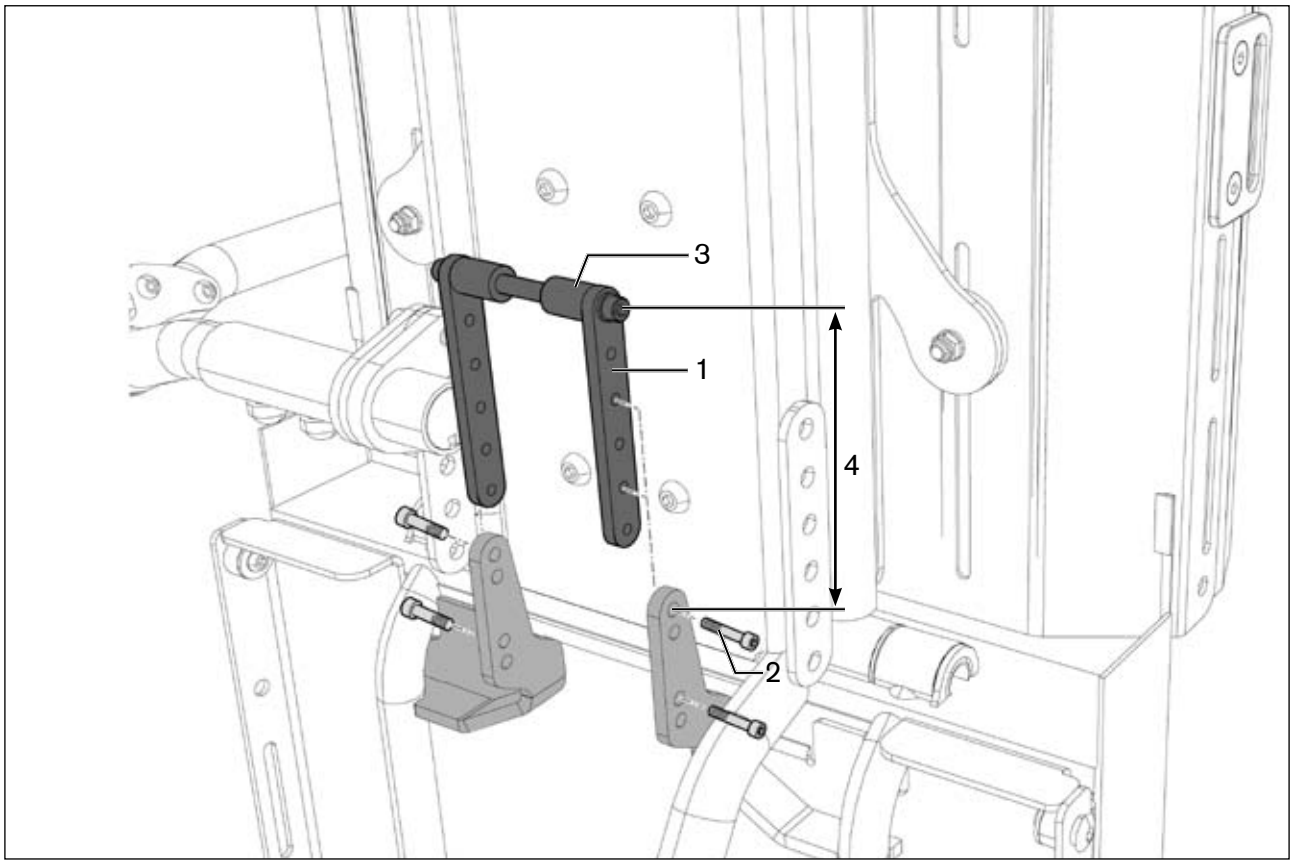


Figure 50 Detail: Adjusting the back compensation

1 Mounting plate
2 Allen head screw
3 Spacer sleeve
4 Control measurement (K)

Length adjustment (mm)	Control measurement K (in mm)	Position of bore holes
163	60	S20 – U22
152	50	R20 – T22
139	40	S21 – U23
128	30	R21 – T23
118	20	S22 – U24
106	10	R22 – T24
97	0	S23 – U25
85	-10	R23 – T25

Table 3 Adjustment values, back length adjustment

6.9.4 Adjusting the Back Compensation

⚠ WARNING

Risk of accidents and injury due to loosening plug and screw connections. Removing the cotter pin (double spring cotter) from the back rest can cause it to fall forward or backward. To avoid injuries at pinch and shear points, carry out such tasks with the support of another person. Make sure to always keep parts of the body (e. g. hands or head) out of the danger zone.

INFORMATION

The back angle adjustment (electrical and mechanical) is set along with the seat depth adjustment.

Setting the Electric Back Angle Adjustment Actuator

Preparation:

❒ Move the seat into the standing position until the screws are freely accessible.

❒ Fold down the back rest (see Section 3.3).

Tools:

❒ 2 x Allen wrench, size 5

Steps:

1. Loosen the two Allen head screws and remove them and the washers (see Figure 52, Items 5, 6).
2. Remove the threaded axle (see Figure 52, Item 2).
3. Slide the actuator (see Figure 52, Item 3) along the adapters (see Figure 52, Item 1) corresponding to the bore holes, taking into consideration the values specified in Table 4.

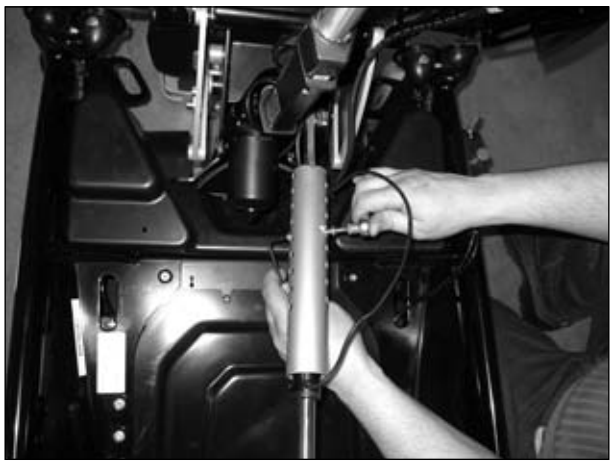


Figure 51 Removing the threaded axle

Properly reassemble all components upon completion of the work.

Perform a function test without any passengers.

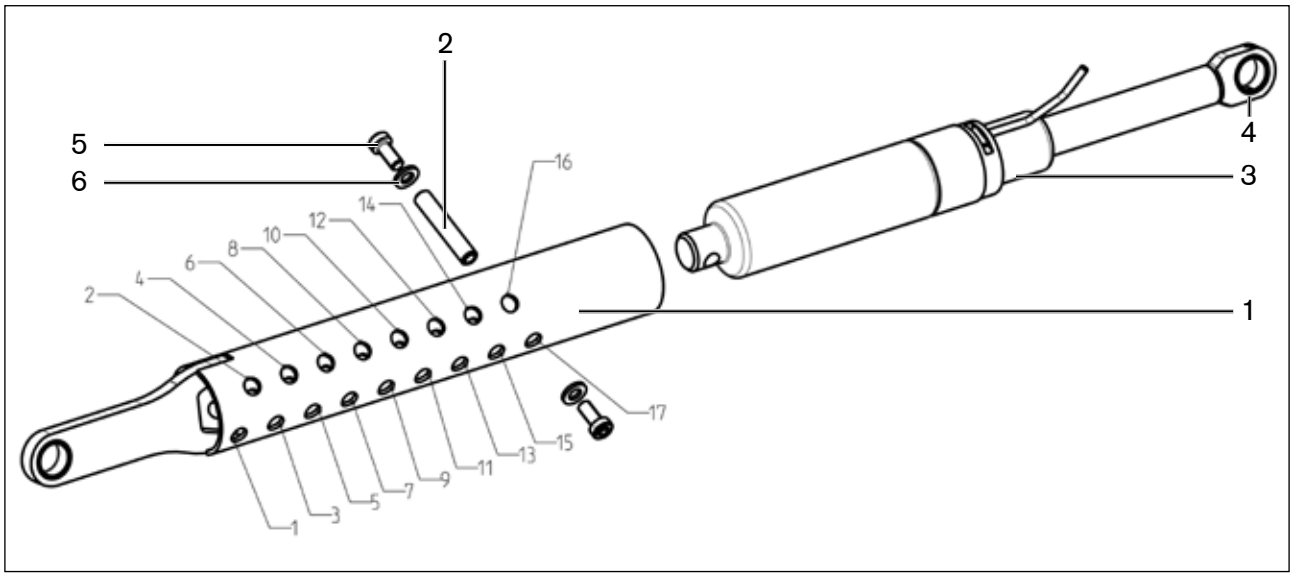


Figure 52 Detail: Setting the electrical back angle adjustment

1 Actuator adapter
2 Threaded axle
3 Actuator
4 Collar bushing with steel back
5 Allen head screw
6 Washer

Seat depth (mm)	Control measurement (K, in mm)	Position Actuator + screw connection / tube
370	90	1
380	100	2
390	110	3
400	120	4
410	130	5
420	140	6
430	150	7
440	160	8
450	170	9
460	180	10
470	190	11
480	200	12
490	210	13
500	220	14
510	230	15
520	240	16
530	250	17

Table 4 Electrical back angle adjustment values

Length setting, mechanical back angle adjustment

⚠ WARNING

Risk of accidents and injury due to failure of the mechanical back angle adjustment. Only use the adjustment values specified in Table 5 to install the front steering brace and the brace bearing.

Preparation:

❒ Move the seat into the standing position until the screws are freely accessible.

❒ Fold down the back rest (see Section 3.3).

Tools:

❒ Allen wrench, size 5

Steps:

1. Loosen and remove the two Allen head screws (see Figure 53, Item 3).
2. Slide and secure the brace bearing (see Figure 53, Item 1) and the steering brace (see Figure 53, Item 2) according to the bore holes, taking into consideration the values specified in Table 5.

Properly reassemble all components upon completion of the work.

Perform a function test without any passengers.

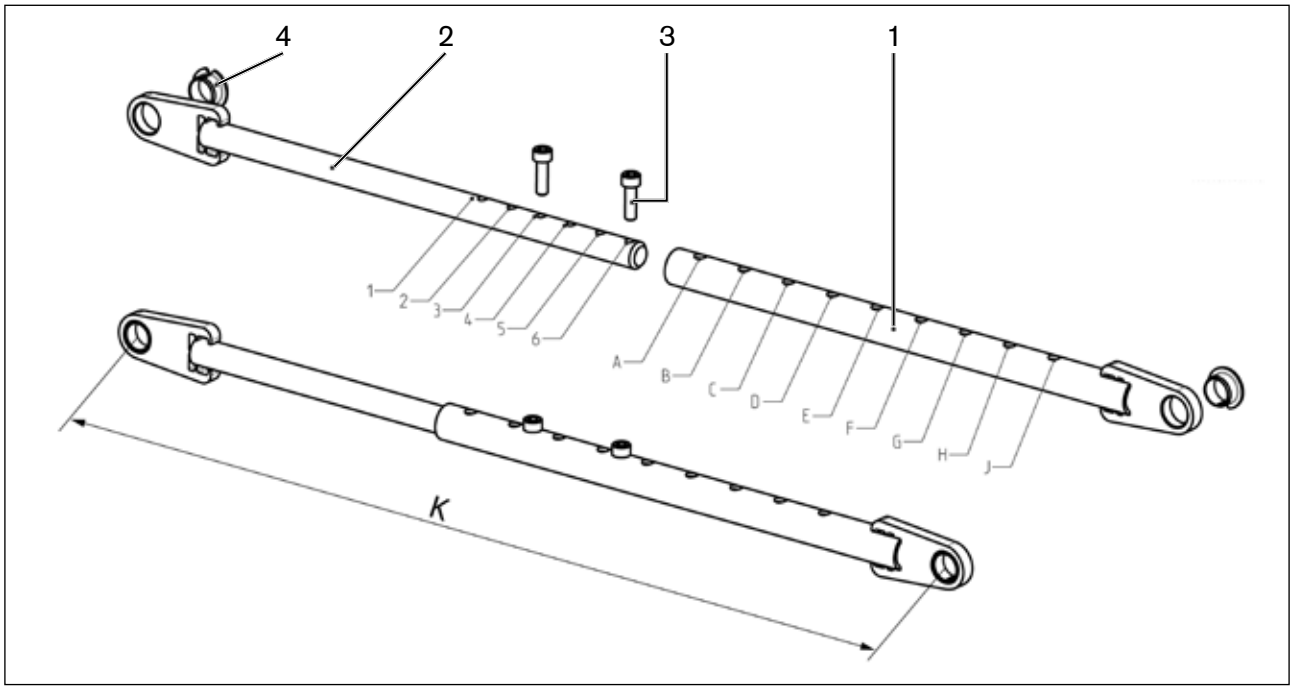


Figure 53 Detail: Setting the mechanical back angle adjustment

1 Brace bearing
2 Front steering brace
3 Allen head screw
4 Collar bushing with steel back

Seat depth (mm)	Control measurement (K, in mm)	Position of bore holes
370	400	H4 — F1
380	410	J6 — G3
390	420	H5 — F2
400	430	G4 — E1
410	440	H6 — F3
420	450	G5 — E2
430	460	F4 — D1
440	470	G6 — E3
450	480	F5 — D2
460	490	E4 — C1
470	500	F6 — D3
480	510	E5 — C2
490	520	D4 — B1
500	530	E6 — C3
510	540	D5 — B2
520	550	C4 — A1
530	560	D6 — B3

Table 5 Mechanical back angle adjustment values

6.9.5 Adjusting the Back Angle

The back angle (angle between the seat and back rest) can be adjusted for the sitting position. In the standing position, the back rest angle is consistent regardless of the back angle in the sitting position.

NOTICE

Risk of cable damage. Ensure the cables attached to the frame with cable ties are not damaged.

⚠ WARNING

Risk of accidents and injury due to loosening plug and screw connections. Removing the screws on the seat adapter can cause the back rest to fall forward or backward. To avoid injuries at pinch and shear points, carry out such tasks with the support of another person. Make sure to always keep parts of the body (e. g. hands or head) out of the danger zone.

Adjusting the Back Angle - Standing Chair Without Tilt

INFORMATION

The back angle can be adjusted in 4 positions.

Preparation:

❒ Move the seat into the standing position until the screws are freely accessible.

Tools:

❒ Allen wrench, size 5

Steps:

1. Hold the back in position with the support of a helper.
2. Loosen and remove the three Allen head screws.
3. Slide and secure the bearing block according to the mounting bore grid in the seat adapter, subject to the values specified in Table 6.

Properly reassemble all components upon completion of the work.

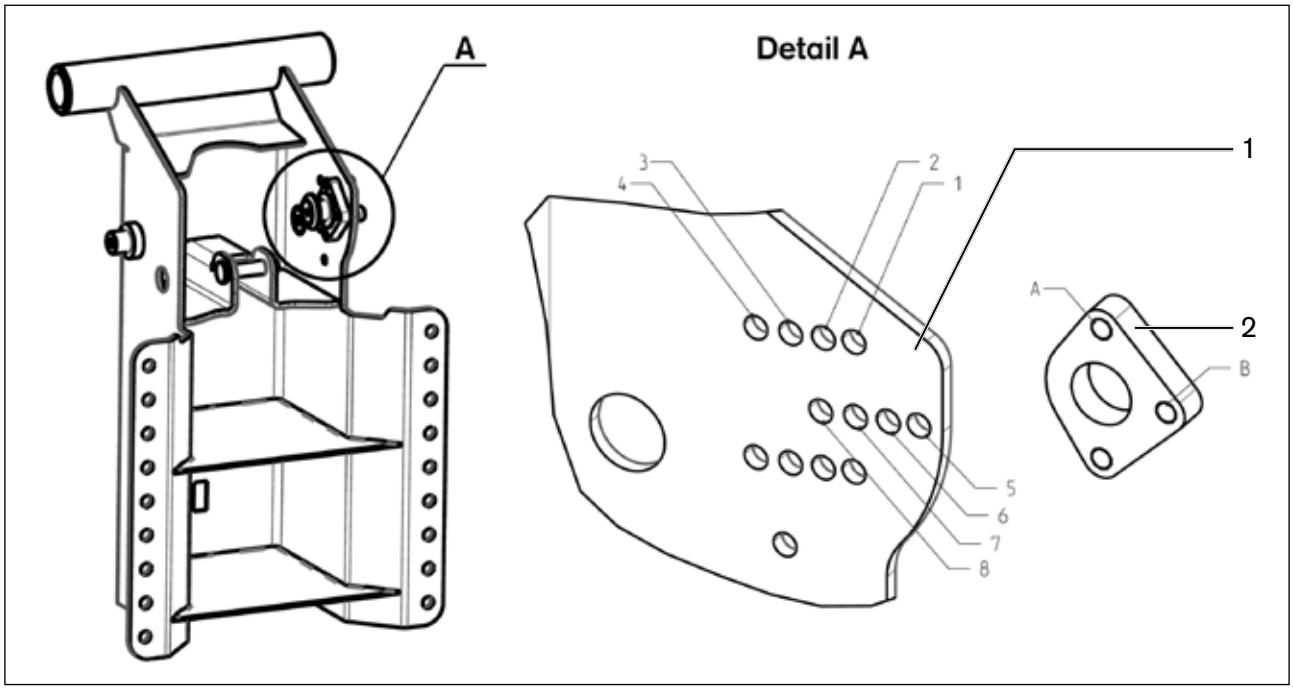


Figure 54 Detail: Adjusting the back angle, standing chair without tilt

1 Seat adapter
2 Bearing block

Seat back angle (°)	Position of bore holes
88	A1 & B5
92	A2 & B6
96,5	A3 & B7
101	A3 & B8

Table 6 Adjustment values - standing chair without tilt

Adjusting the Back Angle - Standing Chair with Tilt

INFORMATION

The back angle can be adjusted in 3 positions.

Preparation:

❒ Move the seat into the standing position until the screws are freely accessible.

Tools:

❒ Allen wrench, size 5

Steps:

1. Hold the back in position with the support of a helper.
2. Loosen and remove the four Allen head screws.
3. Slide and secure the adjustment plate according to the mounting bore grid in the seat adapter, subject to the values specified in Table 7. Ensure that the edge of the adjustment plate is parallel to the edge of the seat adapter.

Properly reassemble all components upon completion of the work.

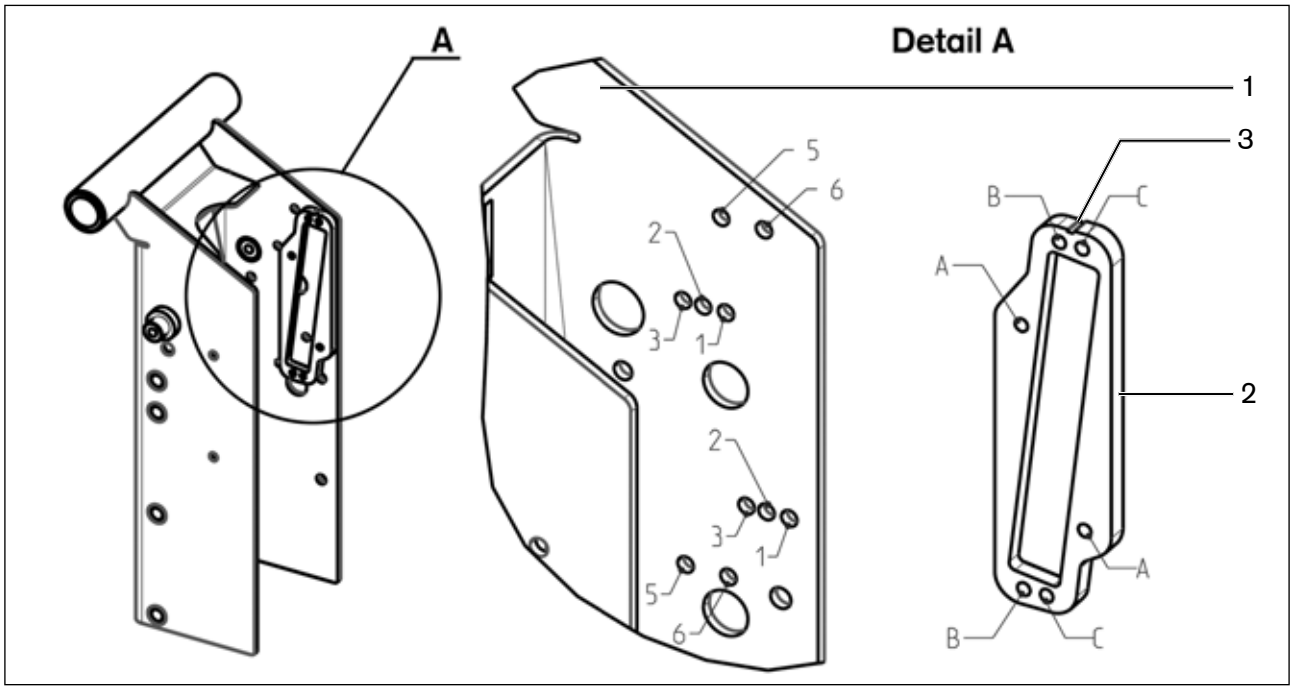


Figure 55 Detail: Back angle adjustment - standing chair with tilt, upper position mark

1 Seat adapter (detail with mounting bores for adjustment plate)
2 Adjustment plate with position mark
3 Position mark, here: upper

Seat back angle (°)	Position of bore holes
88	A1 & B6
93,5	A2 & C6
98	A3 & B5

Table 7 Adjustment values, standing chair with tilt

6.9.6 Arm rest: Height Adjustment

To adapt the arm rests to the upper arm length of the user, select the corresponding mounting bores on the rear of the back rest.

⚠ WARNING

Risk of accidents and injury due to loosening plug and screw connections. Removing the screws on the arm rest adapter allows the arm rest to fall. To avoid injuries at pinch and shear points, carry out such tasks with the support of another person. Make sure to always keep parts of the body (e. g. hands or head) out of the danger zone.

NOTICE

Risk of cable damage. Ensure the cables attached to the back rest with cable ties are not damaged.

INFORMATION

The height of the arm rests on the left and right is adjusted simultaneously.

Tools:

❒ Allen wrench, size 6

Steps:

1. Adjust the arm rests with the support of a helper.
2. Loosen and remove the four Allen head screws holding the arm rests to the back rest while supporting the arm rests so they cannot fall (see Figure 56).
3. Slide and secure the arm rests according to the bore holes, subject to the values specified in Table 8.

Properly reassemble all components upon completion of the work.

Perform a function test without any passengers.

Figure 56 Adjusting the arm rest height

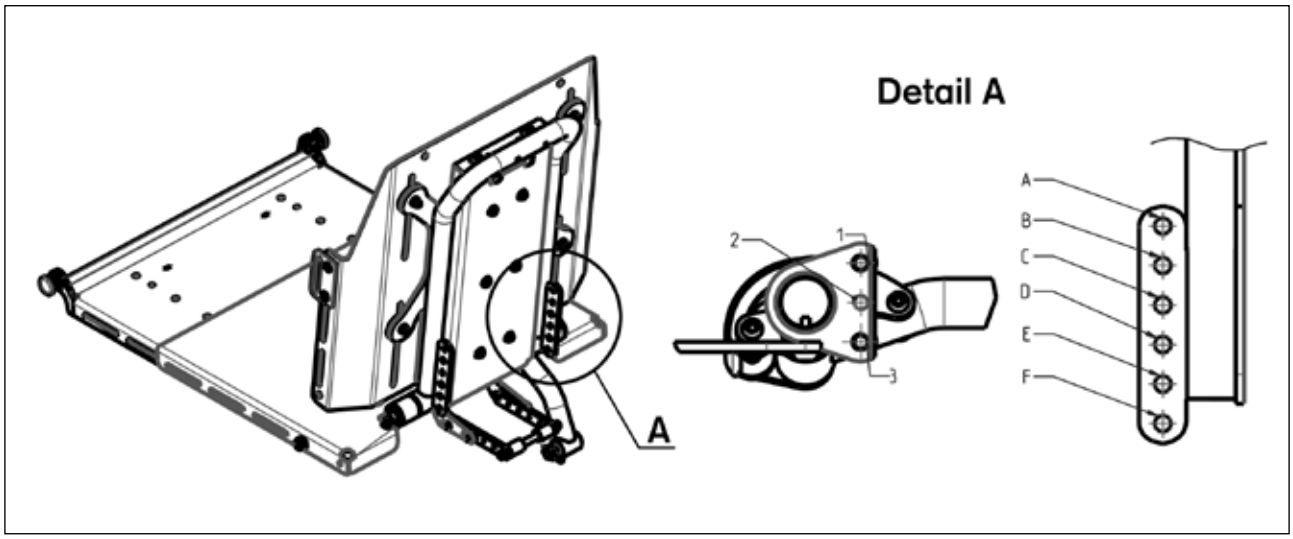


Figure 57 Detail: Adjusting the arm rest height

Arm rest height (mm)	Position of bore holes
327	A2 – B3
307	A1 – C3
287	B1 – D3
267	C1 – E3
247	D1 – F3
227	E1 – F2

Table 8 Arm rest height adjustment values

6.9.7 Arm Rest: Angle Adjustment

NOTICE

Risk of cable damage. Ensure the cables attached to the back rest with cable ties are not damaged.

INFORMATION

The adjustment range is -10° to +20°.

Tools:

❒ Allen wrench, size 4

Steps:

1. Turn the set screw in or out to adjust the angle.

Properly reassemble all components upon completion of the work.

Perform a function test without any passengers.

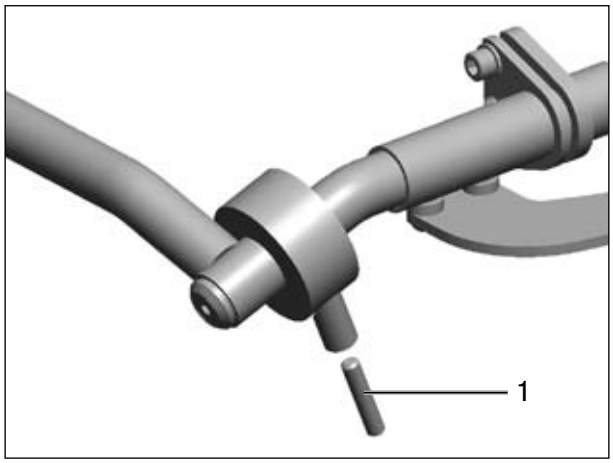


Figure 58 Adjusting the arm rest angle

1 Set screw

6.9.8 Adjusting the Arm Rest Position

NOTICE

Risk of cable damage. Ensure the cables attached to the arm rest with cable ties are not damaged.

To adapt the arm rest to the forearm length of the user, the screw connections on the underside of the arm rest must be changed.

Tools:

❒ Allen wrench, size 3

Steps:

1. Loosen the two set screws on the underside of the arm rest (see Figure 59).
2. If the control panel is attached to the arm rest, the control panel also has to be loosened.
3. Slide the arm rest forward or backward along the attachment rail to the desired position and secure it.

Properly reassemble all components upon completion of the work.

Perform a function test without any passengers.

Figure 59 Adjusting the arm rest position

6.9.9 Adjusting the Supports

NOTICE

Risk of damage to the supports if they are not properly secured. Upon completion of the work, ensure that the support is inserted far enough into the adapter so that it locks in place properly.

The lateral and thoracic supports serve to adjust the seat and back width.

Changing the Position of the Seat Supports

Preparation:

❒ Move the seat into the standing position until the screws are freely accessible.

Tools:

❒ 2 x Allen wrench, size 5

Steps:

1. Loosen the two nuts and remove them if necessary, using the Allen wrench to hold the Allen head screws on the inside (see Figure 60).
2. Slide the support adapter forward or backward along the slotted hole and secure it.

Properly reassemble all components upon completion of the work.

Figure 60 Changing the position of the seat supports

Changing the Position of the Thoracic Supports on the Back Rest

Tools:

❒ 2 x Allen wrench, size 5

Steps:

1. Loosen the two nuts and remove them if necessary, using the Allen wrench to hold the Allen head screws on the inside (see Figure 61 and 64).
2. Slide the support adapter up or down along the slotted hole and secure it.

Properly reassemble all components upon completion of the work.

Figure 61 Changing the position of the back rest support

Adjusting the Height of the Supports / Seat Width

The height of the supports depends on how far they can be inserted into the adapter on the seat frame.

Tools:

❒ Allen wrench, size 2.5

Steps:

1. Loosen the set screw in the adapter.
2. Pull the support out of the adapter.
3. Loosen the two Allen head screws (see Figure 62).
4. Height adjustment: Slide the connecting element up or down.
5. Seat width: Turn the support in or out.

Properly reassemble all components upon completion of the work.

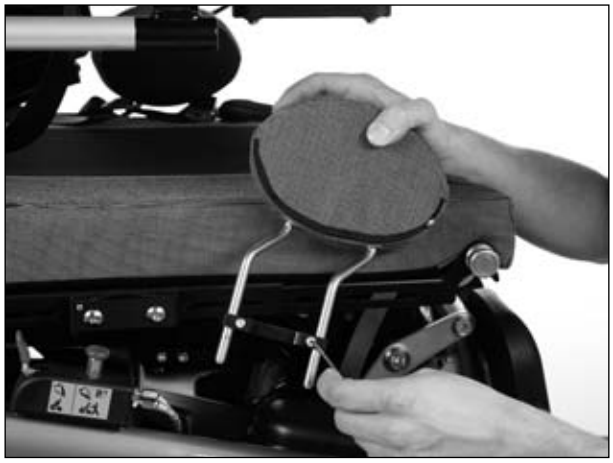


Figure 62 Changing the height setting of the support

6.9.10 Adapting the Seat Cushion

The length of the seat cushion must be adapted to the seat depth.

Tools:

- ❒ Sharp knife
- ❒ Felt-tip pen
- ❒ Measured rule

Steps:

1. Unzip the seat cushion cover completely.
2. Pull the insert halfway out.
3. Measure the length of the insert to be cut off and mark this distance parallel to the back edge.
4. Cut off the excess from the insert with a sharp knife.
5. Replace the insert in the cover and zip the cover.

Properly reassemble all components upon completion of the work.

Figure 63 Adapting the seat cushion length

6.9.11 Adjusting the Seat Depth

⚠ WARNING

Risk of accidents and injury due to loosening plug and screw connections. Removing the screws from the seat bottom can allow the seat bottom to collapse and / or allow the back rest to fall forward or back. To avoid injuries at pinch and shear points, carry out such tasks with the support of another person. Make sure to always keep parts of the body (e. g. hands or head) out of the danger zone.

⚠ WARNING

Risk of accidents and injury due to seat bottom failure. Using the settings specified in Table 9 is mandatory for installing the seat components.

NOTICE

Risk of cable damage. Ensure the cables attached to the seat with cable ties are not damaged.

INFORMATION

The seat depth can be adjusted in increments of 10 mm. Move the seat plate evenly with both hands so that it does not twist.

INFORMATION

The seat depth is set at the same time as the back adjustment (electrical and mechanical, see Section 6.9.4/6.9.5).

Preparation:

❒ Move the seat into the standing position until the screws are freely accessible.

Tools:

❒ Allen wrench, size 5

Steps:

1. Remove the supports on the seat plate by removing the two Allen head screws on each support.

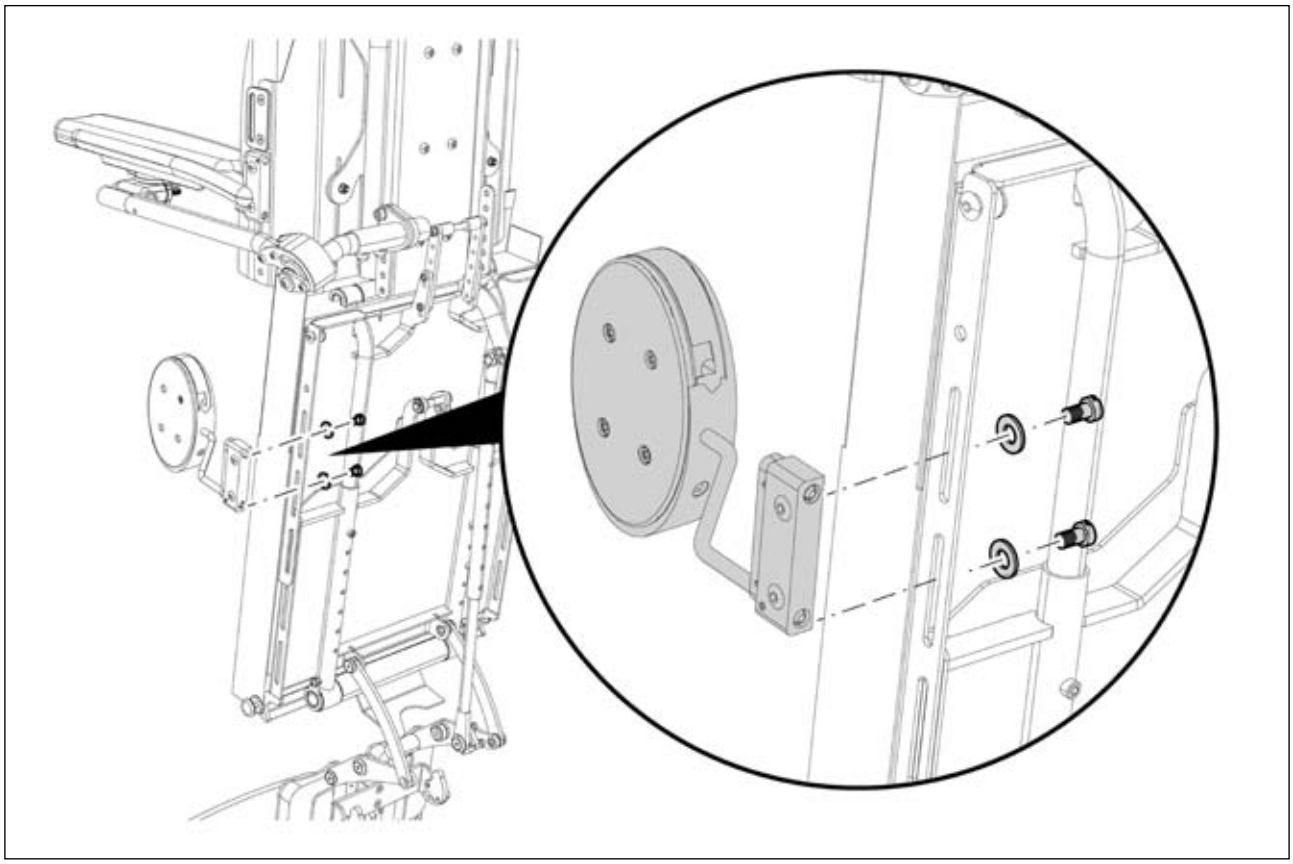


Figure 64 Removing the supports

2. Hold the back and seat plate in position with the support of a helper.
3. Loosen the two Allen head screws on the connecting tube under the two seat plates located one on top of the other (Figure 65, Item 1).
4. Slide and secure the seat plates according to the bore holes, subject to the values specified in Table 9.

Properly reassemble all components upon completion of the work.

Perform a function test without any passengers.

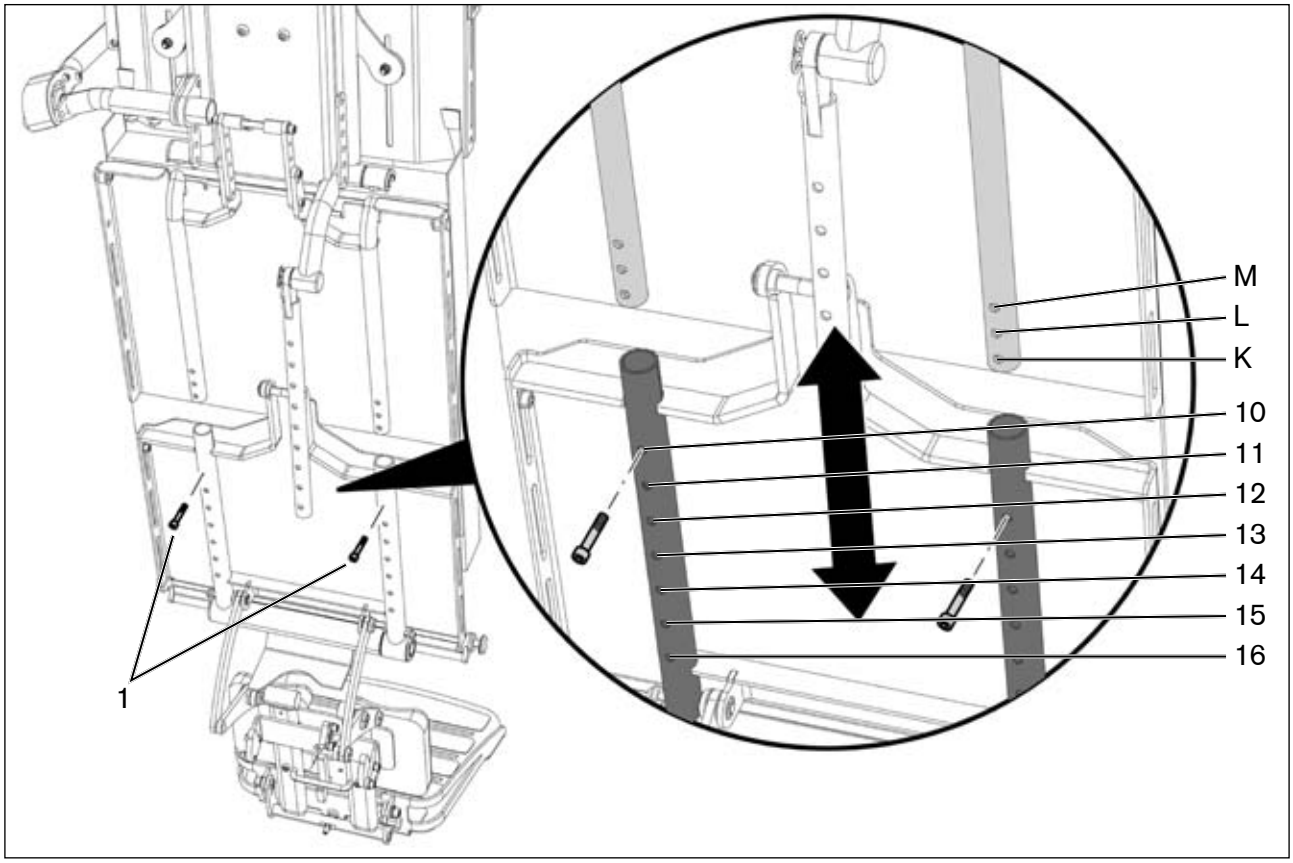


Figure 65 Adjusting the seat depth

1 Allen head screws to adjust the seat plates

Seat depth (mm)	Control measurement (K, in mm)	Position of bore holes
370	412,5	M — 15
380	422,5	K – 16
390	432,5	L – 15
400	442,5	M – 14
410	452,5	K – 15
420	462,5	L – 14
430	472,5	M – 13
440	482,5	K – 14
450	492,5	L – 13
460	502,5	M – 12
470	512,5	K – 13
480	522,5	L – 12
490	532,5	M – 11
500	542,5	K – 12
510	552,5	L – 11
520	562,5	M – 10
530	572,5	K – 11

Table 9 Seat depth adjustment values

6.9.12 Adjusting the Seat Height

NOTICE

Risk of cable damage. Ensure the cables attached to the stand-up unit with cable ties are not damaged.

⚠ WARNING

Risk of accidents and injury due to loosening plug and screw connections. Removing the screws can result in uncontrolled movements of the stand-up unit. To avoid injuries at pinch and shear points, carry out such tasks with the support of another person. Make sure to always keep parts of the body (e. g. hands or head) out of the danger zone.

⚠ WARNING

Risk of accidents and injury due to failure of the connections. Using the adjustment values specified in Table 10 for the installation of the stand-up unit is mandatory.

⚠ CAUTION

Risk of injury during tasks that involve lifting. When repair and maintenance tasks must be completed under raised parts or equipment, ensure suitable precautions are taken to secure the applicable components against falling. Equipment used to raise loads must prevent the load from accidentally shifting in a dangerous manner, dropping in free fall or being accidentally released.

INFORMATION

The seat height can be adjusted in increments of **25 mm**.

Preparation:

❒ Remove the calf pad (see Section 6.9.16).

Tools:

❒ Allen wrench, size 6

❒ Torque wrench

❒ Hoisting device of sufficient capacity

Steps:

1. Secure the seating unit with the help of a hoisting device of sufficient capacity.
2. Loosen the six Allen head screws.
3. Slide and secure the seat according to the bore holes, subject to the values specified in Table 10.
4. Inspect the screws for damage and replace if required, replace the thread locks.

Properly reassemble all components upon completion of the work. Perform a function test without any passengers.

INFORMATION

When installing the seating unit, tighten all six Allen head screws to a torque of 25 Nm.

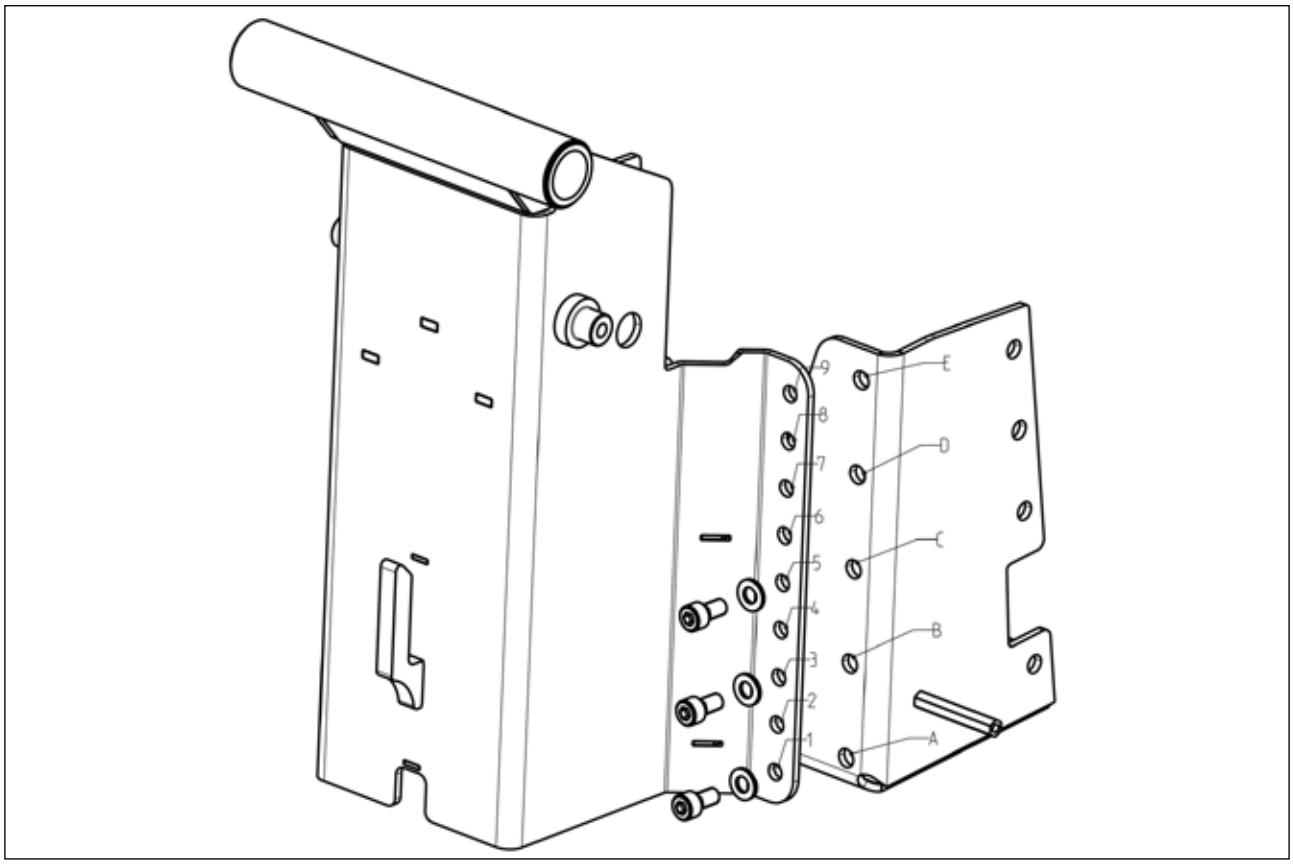


Figure 66 Detail: Adjusting the seat height

Seat height (SH)	Screw connection		
53	1/A	3/B	5/C
55,5	2/B	4/C	6/D
58	1/B	3/C	5/D
60,5	2/C	4/D	6/E
63	1/C	3/D	5/E

Table 10 Seat height adjustment values

6.9.13 Adjusting the Footplate

⚠ WARNING

Risk of accidents and injury due to footrest failure. Using the adjustment values specified in Table 11 for the installation of the footrest is mandatory. Removing the screws can result in uncontrolled movements of the stand-up unit. To avoid injuries at pinch and shear points, carry out such tasks with the support of another person. Make sure to always keep parts of the body (e. g. hands or head) out of the danger zone.

INFORMATION

The lower leg length can be adjusted in increments of 20 mm. Move the attachment rail evenly with both hands so that it does not twist.

Adjusting the Footplate to the Lower Leg Length

Tools:

❒ Allen wrench, size 5

Steps:

1. Move the seat into the sitting position and raise the footrest.
2. Loosen and remove the two Allen head screws on the back of the attachment rail.
3. Slide the attachment rail with footplate up or down along the support rail according to the bore holes as specified in Table 11 and secure it.

Properly reassemble all components upon completion of the work.

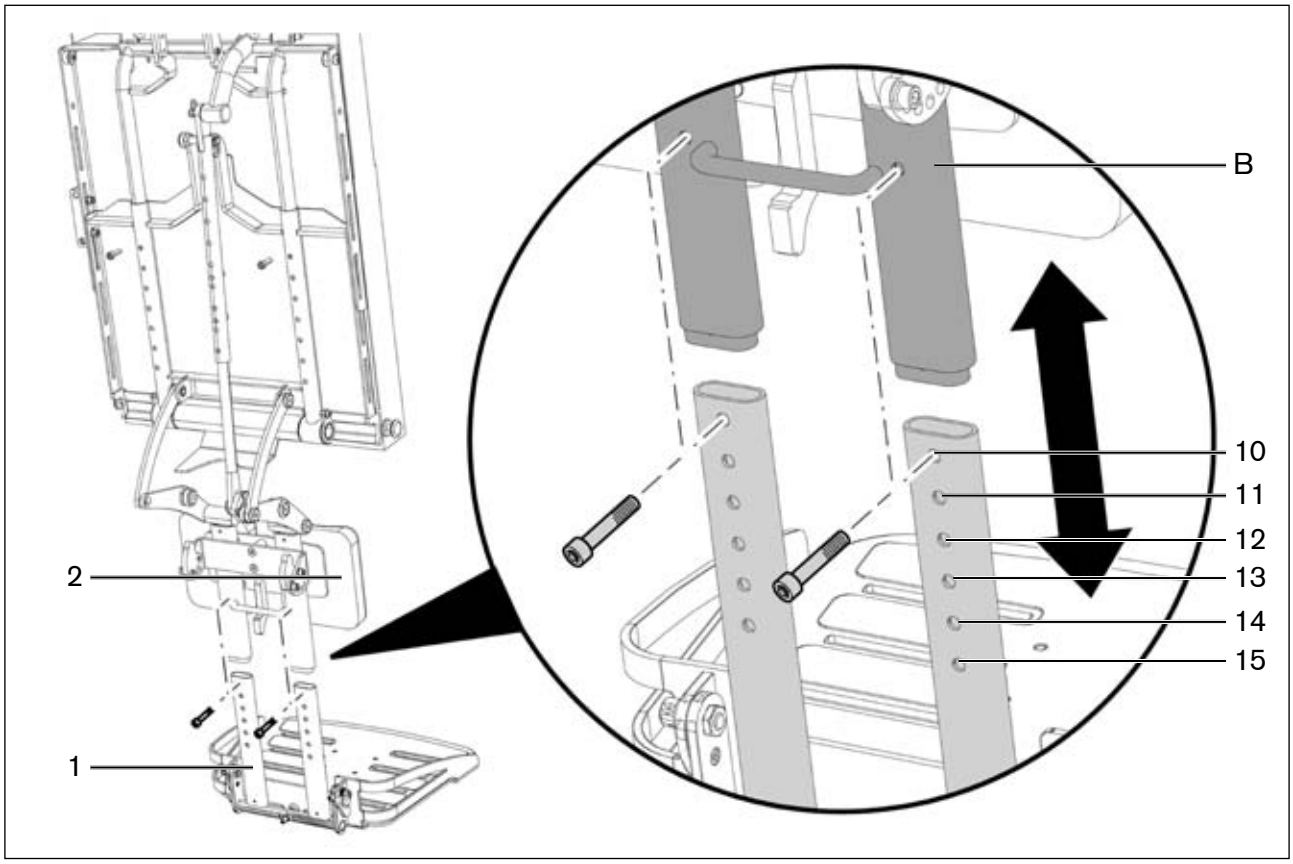


Figure 67 Adjusting the footplate to the lower leg length / removing the footplate

1 Footrest adjustment
2 Calf pad

Combination 1 (mm)	Combination 2 (mm)	Position of bore holes
Footrest, short. LL 39 – 49 cm 491B58 = SK010	**Footrest long. LL 44 – 52 cm 491B58 = SK020**	
Item 1: Footrest adjustment short 491B58 = SB050	**Item 1: Footrest adjustment long 491B58 = SB060**	
Item 2: Calf pad 481B08 = ST109	**Item 2: Calf pad 481B08 = ST151**	
490	-	B – 10
470	520	B – 11

450	500	B – 12
430	480	B – 13
410	460	B – 14
390	440	B – 15

Table 11 Lower leg length adjustment values

Adjusting the Footrest Angle

The angle of the footrest is determined by the bore hole selected in the adapter (Item B).

1. Loosen the right and left attachment screws (Item C).
2. Loosen and remove the right and left adjustment screws (Item D) on the adapter.
3. Select the bore hole for the desired footrest angle, subject to the values specified in Table 12, and firmly retighten the adjustment screws (Item D).
4. Retighten the attachment screws (Item C).

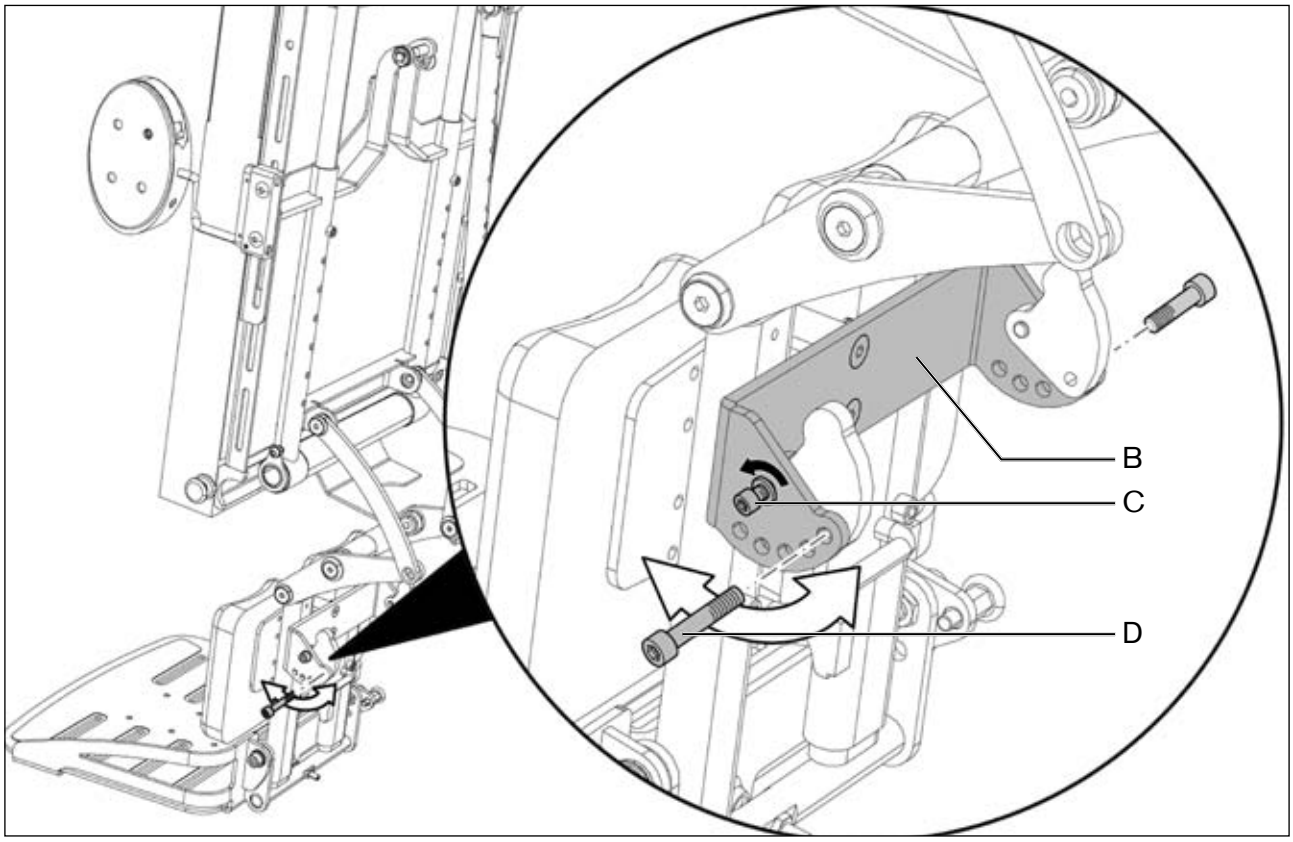


Figure 64 Adjusting the footplate angle

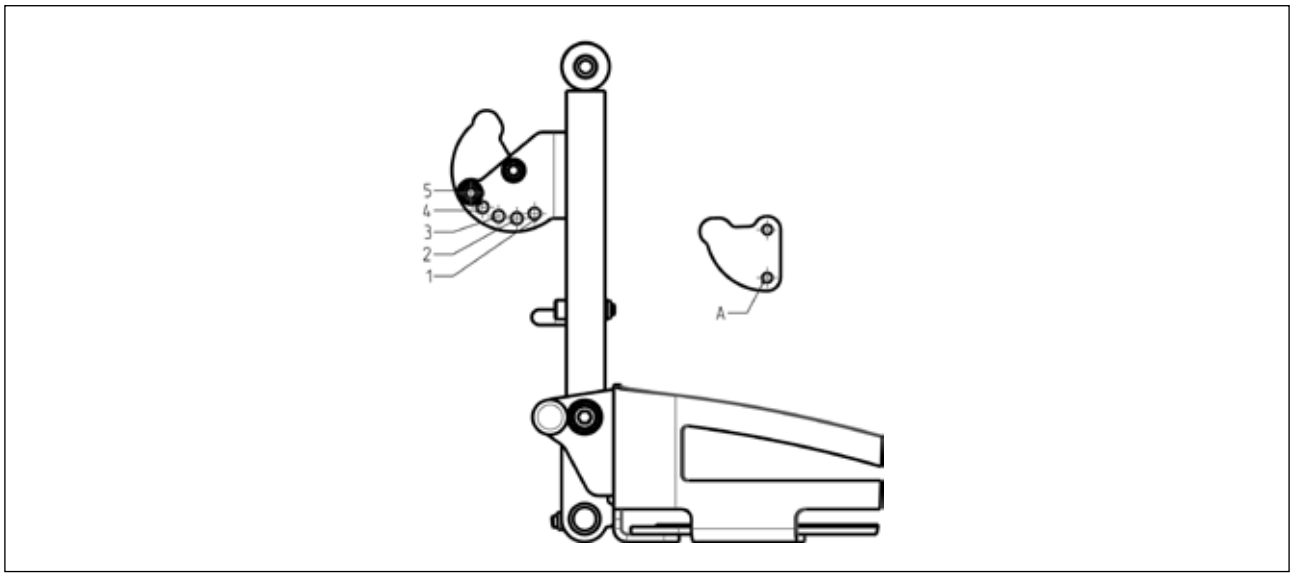


Figure 68 Detail: Adjusting the footrest angle

Knee angle (°)	Position of bore holes
90	A – 1
96	A – 2
102	A – 3
107	A – 4
111	A – 5

Table 12 Footrest angle adjustment values

6.9.14 Adjusting the Footplate Angle

INFORMATION

The foot angle in the sitting position affects the foot angle in the standing position.

Preparation:

❒ Flip up and lock the footplate.

Tools:

❒ Open-end or combination wrench, size 10

❒ Allen wrench, size 4

Steps:

1. Loosen the counter nut (Figure 69, Item 2).
2. Hold the footplate at the desired angle.
3. Adjust the Allen head screws so that they are equidistant from the transverse shaft (Figure 69, Item 1). Tighten the counter nut (Figure 69, Item 2).

Properly reassemble all components upon completion of the work.

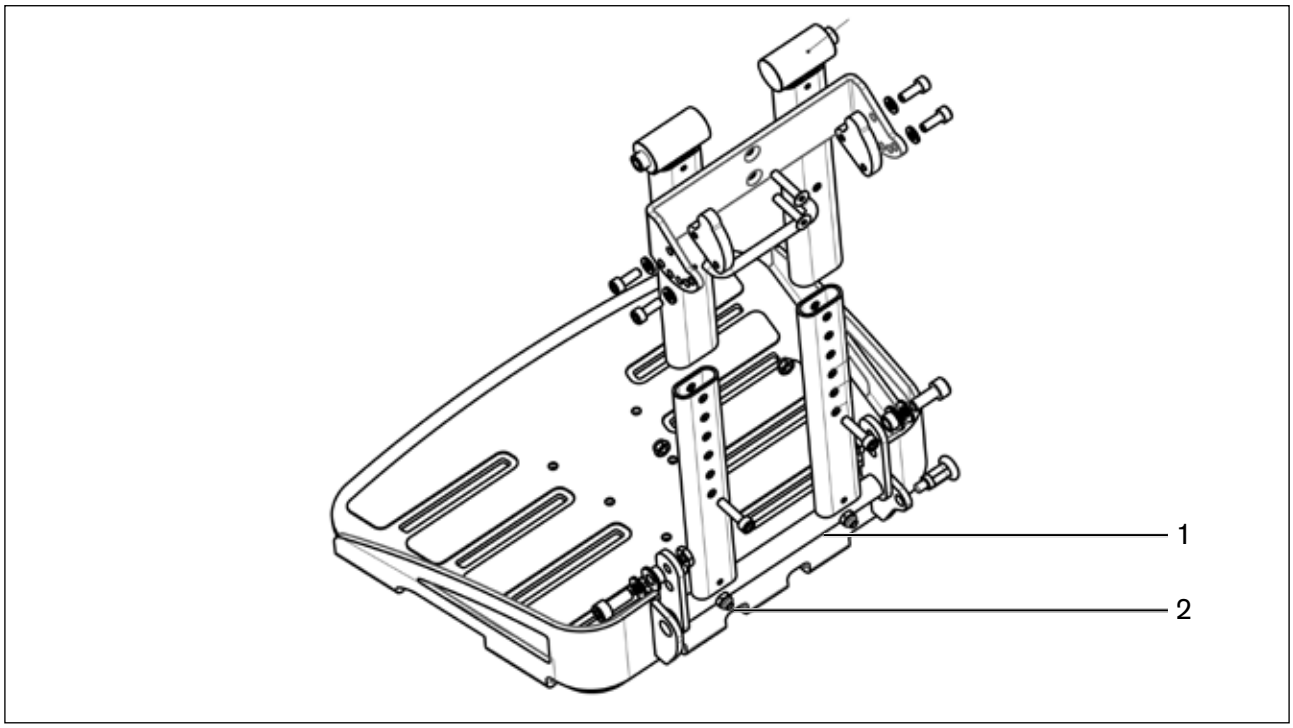


Figure 69 Detail: Adjusting the footplate angle

1 Transverse shaft
2 Allen head screw

6.9.15 Chest Belt

Adjusting the Width

The chest belt length can be adjusted on both sides.

1. Position the chest belt pad in the middle of the body.
2. The position of the chest belt pad is adjusted by changing the buckle position.

Figure 70 Adjusting the Chest Belt Length

Adjusting the Height

Tools:

❒ Allen wrench, size 4

❒ Open-end or combination wrench, size 10

Steps:

1. Loosen the two hexagon nuts on the right and left of the back frame, respectively, and remove them if required. Provide counter-support with an Allen wrench.
2. Slide or shift the belt adapter bracket along the slotted holes. The belt adapter can also be installed along with the support adapter. In order to do so, screws that are 5 mm longer need to be used.

Properly reassemble all components upon completion of the work.

Figure 71 Adjusting the chest belt height

6.9.16 Lap Belt

Adjusting the Lap Belt Length

The lap belt length is adjustable on both sides.

1. Position the buckle halves in the middle of the body.
2. The position of the buckle halves can be varied by positioning them at right angles in relation to the belt; any excess belt length will be held in place by the plastic slide.

Figure 72 Adjusting the lap belt

6.9.17 Knee Belt

Adjusting the Width

The width of the knee belt is changed by adjusting the length of the two belt parts on the right and left of the pad.

The position of the adapter for the knee belt cannot be changed.

Figure 73 Adjusting the knee belt

6.9.18 Calf Pad

Replacing the Calf Pad

Preparation:

❒ Move the seat to the sitting position

Tools:

❒ Allen wrench, size 5

❒ Allen wrench, size 4

Steps:

1. Loosen both of the centre Allen head screws using the Allen wrench, size 5. Provide counter-support with the Allen wrench, size 4.
2. Remove the calf pad and replace if required.

Properly reassemble all components upon completion of the work.

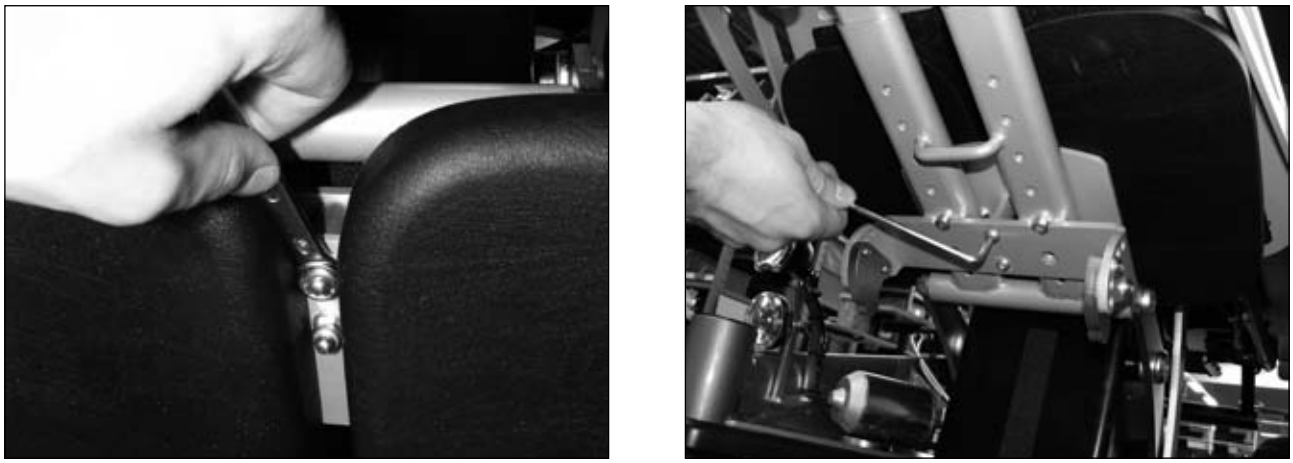


Figure 74 Removing the calf pad

Adjusting the Calf Pad

The height and width of the calf pad can be adjusted relative to the footplate. Depending on the position, the footplate cannot be flipped up.

Preparation:

❒ Remove the calf pad (see Section 6.9.17).

Tools:

❒ Allen wrench, size 4

Steps:

1. Loosen the two Allen head screws on the right and left of the calf pad support, respectively; replace and secure them according to the position grid (Figure 75).

Properly reassemble all components upon completion of the work.

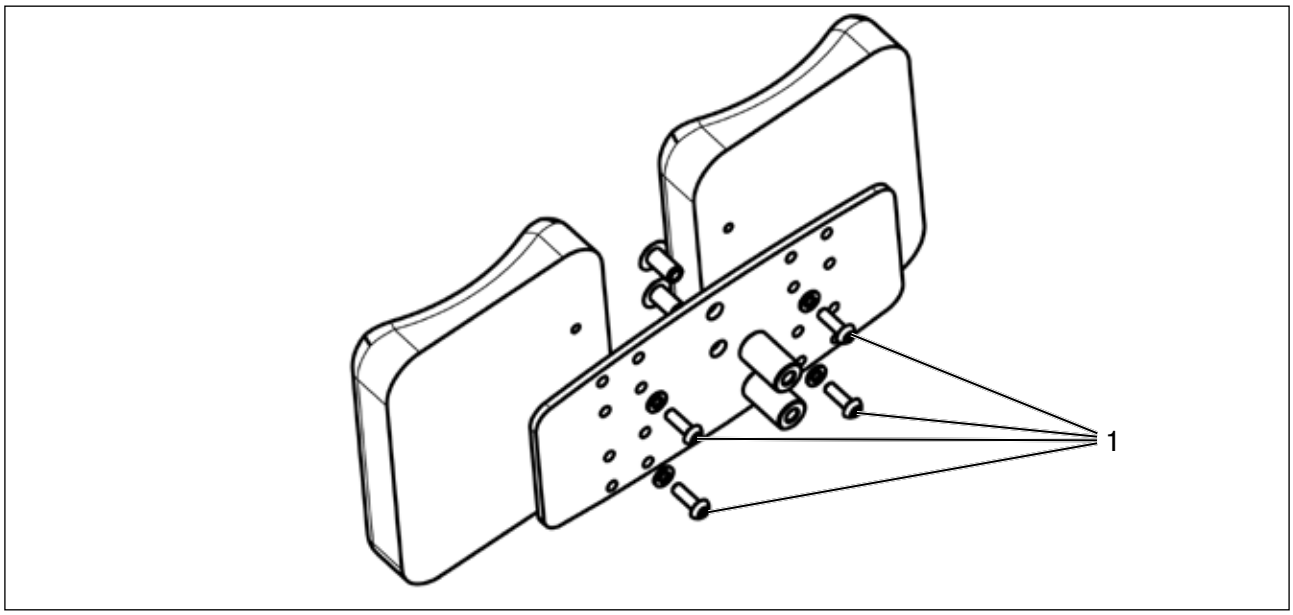


Figure 75 Detail: Adjusting the calf pad

1 Attachment screws

6.9.19 Attaching the Knee Band to the Footrest / Calf Pad Plate (Optional)

Preparation:

❒ Bring the Xeno to the sitting position.

❒ Flip up the footrest and secure it against folding down.

Tools:

❒ Allen wrench, size 4 and 5

Steps:

1. Loosen the screw connection between the calf pad plate and footrest.

INFORMATION

The round nuts (see Figure 76, Item 1) are not used for the installation of the knee band.

Attach the knee band adapter to the calf pad plate using two M6x30 Allen head screws and spacer bushings, ensuring a firm fit.

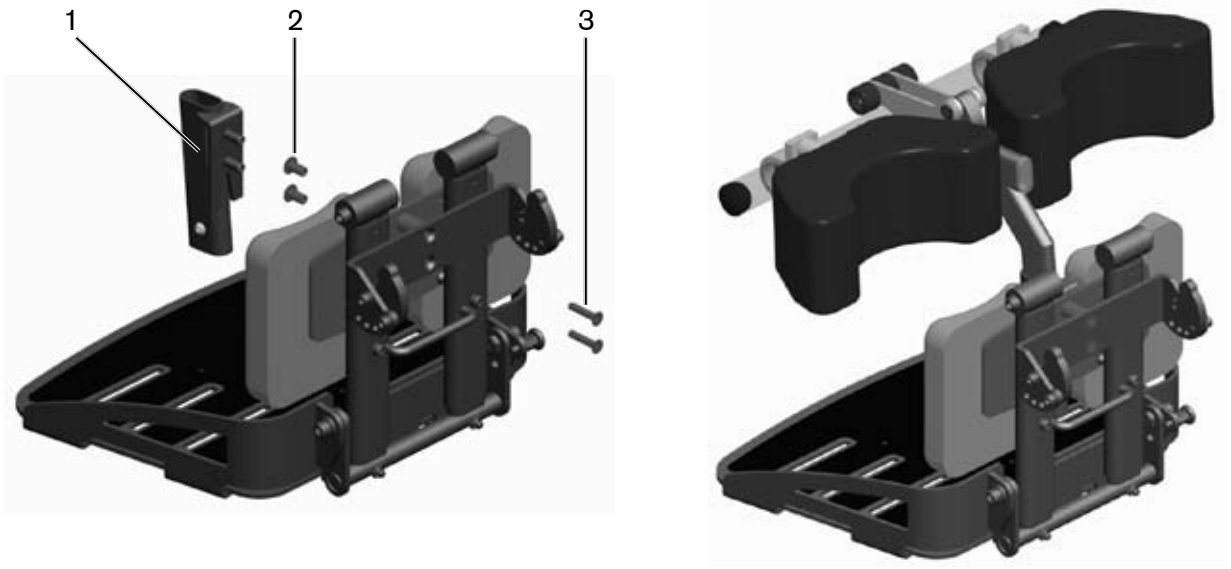


Figure 76 Installing the knee band

1 Receiver tube
2 Round nuts (not used for the installation of the knee pad band)
3 Allen head screws M6x30

Adjustment possibilities:

INFORMATION

With the large calf pads, the knee band cannot be installed at the narrowest setting.

Knee Pad Depth and Width Adjustment

Tools:

❒ Allen wrench, size 4 and 5

❒ Circlip pliers

Steps:

❒ See the legend, Figure 77, for the depth and width adjustment of the knee pads.

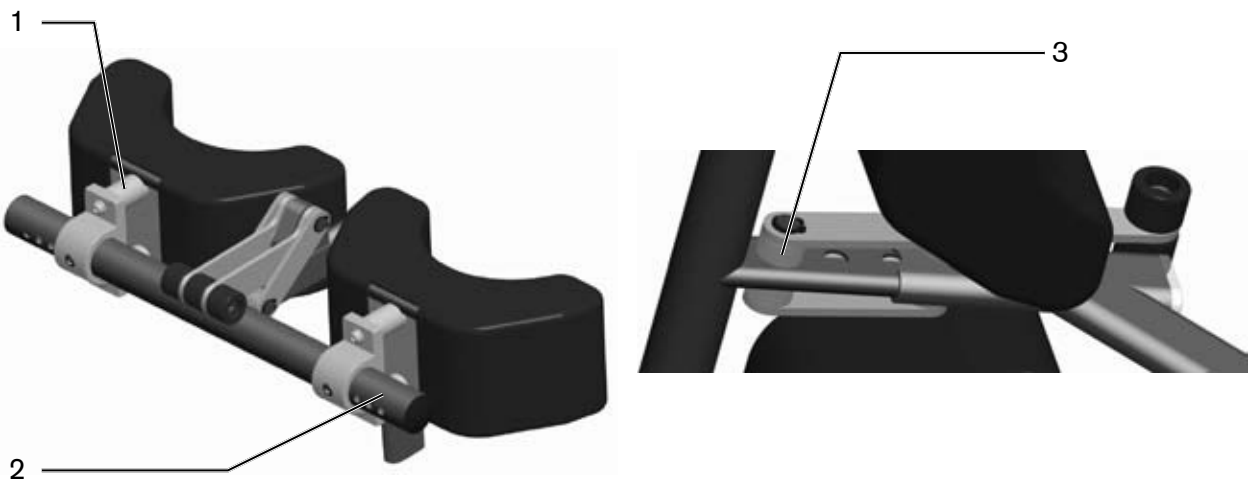


Figure 77 Knee pad depth adjustment (SA_XENO_05.jpg and SA_XENO_02.jpg)

1 Knee pad depth adjustment via spacer bushings (30 mm and 20 mm)
2 Knee pad width adjustment via bore hole grid
3 Knee pad depth adjustment via lever installation in the bore hole grid

Knee Band Height Adjustment

Tools:

❒ Allen wrench, size 4 and 5

Steps:

1. Remove the stop screw from the knee band adapter.
2. After removing the stop screw, the knee pad band position can be lowered.

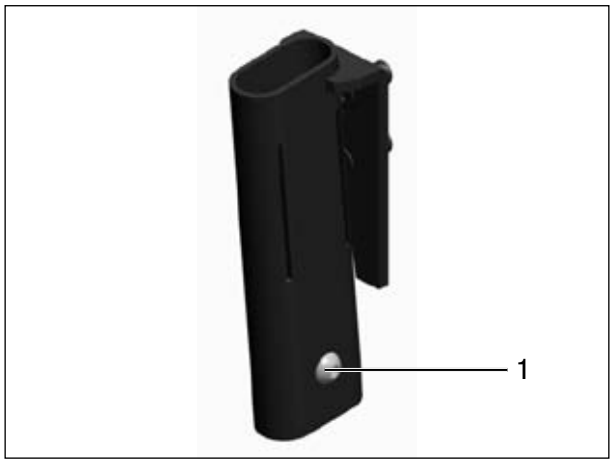


Figure 78 Knee band height adjustment

1 Stop screw

6.10 Seat Adjustment Actuators

Depending on the preferences of the user, the Xeno power wheelchair is equipped with one or multiple actuators responsible for the various seat positions with respect to standing, seat tilt and back angle adjustment.

NOTICE

Risk of cable damage. Take note of the cables attached to the seat frame with cable ties. Carefully cut the cable ties with side-cutting pliers or a knife. Ensure that you do not damage the cables during this process. Ensure that the cable lengths are sufficient in all positions.

6.10.1 Adjusting the Stand-up Device Actuator

⚠ **CAUTION**

Risk of accident and injury due to improper work on the stand-up device. In order to avoid damage to and malfunction of the stand-up device, installation and removal of the stand-up device, including the actuator, may only be performed in the facilities of Otto Bock Manufacturing Königsee GmbH.

The magnetic switch on the seat actuator determines the position limit of the stand-up device.

Preparation:

❒ Move the seat into the standing position until the screws are freely accessible.

Tools:

❒ Allen wrench, size 2

Steps:

1. Loosen the Allen head screw (Figure 80, Item 1).
2. Position the sensor by sliding it along the scale (see label, Figure 80). The reading value is above the sensor in this case.
3. Tighten the Allen head screw using only minimal torque.

Figure 79 Magnetic switch on the standing-up device actuator, here before label is attached

Figure 80 Standing-up device actuator with label

1 Allen head screw

6.10.2 Replacing the Back Angle Adjustment Actuator

⚠WARNING

Risk of accidents and injury due to loosening plug and screw connections. Removing the cotter pin (double spring cotter) from the back rest can cause it to fall forward or backward. To avoid injuries at pinch and shear points, carry out such tasks with the support of another person. Make sure to always keep parts of the body (e. g. hands or head) out of the danger zone.

Preparation:

❒ Move the seat into the standing position until the screws are freely accessible.

❒ Push up the back rest with one hand, press the unlock button and release the belt lock; then lower the back rest (see Section 3.3).

Tools:

❒ 2 x Allen wrench size 5

Steps:

1. Pull the cotter pin and remove the actuator from the collar bushing (see Fig. 53, Item 3, 4).
2. Loosen the two Allen head screws and remove them and the washers (see Fig. 52, Items 5, 6).
3. Remove the threaded axle (Fig. 52, Item 2).
4. Remove actuator (see Fig. 52, Item 2) and replace if required.

Properly reassemble all components upon completion of the work.

6.10.3 Seat Tilt Actuator

⚠ CAUTION

Risk of accident and injury due to improper work on the seat tilt actuator. In order to avoid damage to and malfunction of the seat tilt, installation and removal of the seat tilt actuator, may only be performed in the facilities of Otto Bock Manufacturing Königsee GmbH.

6.11 Replacing the frame

⚠ CAUTION

Risk of accidents and injury due to improper work on the frame. In order to avoid damage and malfunction when operating the power wheelchair, installation and removal of the frame, may only be performed in the facilities of Otto Bock Manufacturing Königsee GmbH.

6.12 Replacing the Drive Unit Support

⚠ CAUTION

Risk of accidents and injury due to improper work on the drive unit support. In order to avoid damage and malfunction when operating the power wheelchair, installation and removal of the drive unit support, may only be performed in the facilities of Otto Bock Manufacturing Königsee GmbH.

6.13 Replacing the drive motor

⚠CAUTION

Risk of injury due to electric current. Turn off the control unit of the power wheelchair, remove the fuse (see Section 6.2) and disconnect all plug connections to the control unit / power module before performing any work on the drive motors.

Preparation:

❒ Remove the drive wheel (see Section 6.5.2).

❒ Remove the splash guard (see Section 6.5.10).

Tools:

❒ Allen wrench, size 6

❒ Allen wrench, size 5

Steps:

1. Disconnect the motor connection on the controller.
2. Disconnect the wheel lock release (see Section 6.6.1).
3. Disconnect the damping element on the oscillating crank.
4. Loosen the four Allen head screws.
5. Remove the motor and replace if required.

Properly reassemble all components upon completion of the work.

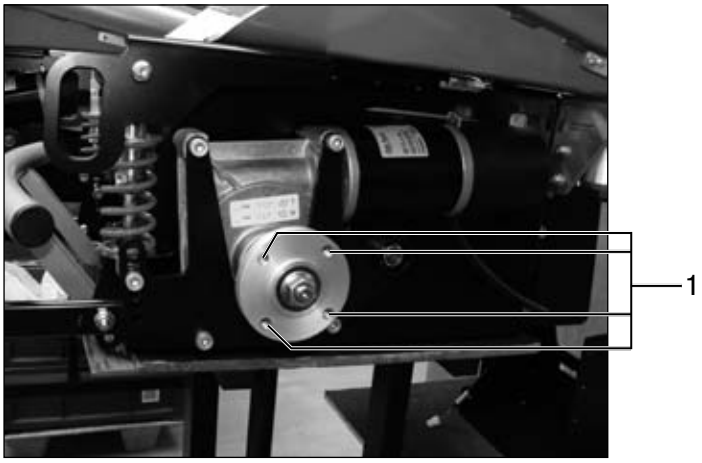


Figure 81 Replacing the drive motor

1 Allen head screws

6.14 Replacing the Oscillating Crank

INFORMATION

When attaching the motors to the oscillating cranks, be sure to tighten the bottom screws first.

Each motor is attached to the oscillating cranks with 4 Allen head screws. The oscillating cranks are attached to the drive unit sustainer with one screw each.

Preparation:

❒ Remove the drive motor (see Section 6.13).

Tools:

❒ Socket, size 19

Steps:

1. Loosen the hexagon nut.
2. Remove the oscillating crank and replace if required.

Properly reassemble all components upon completion of the work.

Figure 82 Replacing the oscillating crank

6.15 Replacing/Retrofitting Control Elements

6.15.1 Mounting an LCD Monitor

INFORMATION

Additional information and operating instructions for the LCD monitor are contained in a separate manual.

A separate LCD monitor with infrared and Bluetooth (optional) is available to operate special controls and for environment control functions. It is mounted on the armrest on the opposite side from the control panel.

Figure 83 LCD monitor

Tools:

❒ Allen wrench, size 2 mm

Steps:

1. Slide the holder (standard holder; height and/or laterally adjustable holder; swan neck holder) onto the attachment rail underneath the armrest and attach with two set screws.

Figure 84 Attaching the holder

2. Attach the LCD monitor to the holder with three Allen head screws.

Figure 85 Attaching the LCD monitor to the holder

3. Connect the extension cable.
4. Connect the LCD monitor to the controller.
5. Complete a function test (for information on menus, see the enAble 50 instructions for use).

6.15.2 Replacing the control panel

NOTICE

Loss of connection between the plug and control panel! Should the connection plug come loose during driving, e. g. caused by vibrations, the connection to the control panel will get lost and the power wheelchair trigger an emergency stop. When connecting the plugs, ensure that they are firmly connected to each other.

NOTICE

Cable damage! Positioning the cable incorrectly can lead to pinching and thus damage to the cable. The cable must not be attached too tightly or too loosely. Avoid bending or squeezing the cable.

Tools:

❒ Phillips screwdriver

Steps:

1. Unplug the connection on the back of the backrest by pushing the white plastic switch up and pulling the plugs apart.

Figure 86 Controller/control panel connector plug

2. Loosen all cable ties attaching the connection cable to armrest.
3. Pull the control panel forward out of the rail.
4. Detach the rail from the armrest.

Properly reassemble all components upon completion of the work.

6.15.3 Mounting the Swing-away Control Panel Holder

Preparation:

❒ Remove the control panel (see Section 6.15.2).

Tools:

❒ Phillips screwdriver

Steps:

1. Separate the control panel and holder by loosening the four Phillips head screws on the underside of the control panel holder.
2. Replace the control panel holder.

Properly reassemble all components upon completion of the work.

Figure 87 Mounting the swing-away control panel holder

6.15.4 Retrofitting Attendant Controls

Attendant controls are shipped as a mounting kit and are attached to the cross tube of the backrest on the Xeno power wheelchair. Two bore holes are provided for this purpose on the left and right of the back tube, respectively.

Figure 88 Attendant control

Tools:

❒ Allen wrench, size 6 mm

Steps:

1. Hold the bracket for the attendant controls against the back tube.
2. Attach with two Allen head screws.

Figure 89 Attaching holder for attendant control

3. Insert the tube with the attendant controls
4. Connect the attendant controls to the controller.

6.15.5 Installing joystick accessories

Tools:

❒ Allen wrench, size 6 mm

Steps:

1. Slide off the top of the joystick.
2. Slide an accessory such as the fork for tetraplegics, golf ball, stick etc. onto the metal pin.
3. Mount the accessory by tightening the set screw.

Figure 90 Installing joystick accessories

6.16 Retrofitting Accessories

6.16.1 Mounting Kit for Headrest Attachment

The headrest holder is attached to the back frame using an adapter plate.

Tools:

❒ Allen wrench, size 3

❒ Ring wrench or open-end wrench, size 10 mm

Steps:

1. Attach the holder to the top of the back tube with two Allen head screws nuts.

Figure 91 Mounting kit for headrest attachment

6.16.2 Mounting Kit for Signal Panel

The signal panel holder is attached to the back frame using an adapter plate.

Tools:

❒ Allen wrench, size 3

❒ Ring wrench or open-end wrench, size 10 mm

Steps:

1. Attach the holder to the top of the back tube with two Allen head screws nuts.
2. Hook the signal panel in place.

6.16.3 Rear-view mirror

Tools:

❒ Allen wrench, size 3

Steps:

1. Loosen the two set screws on the guide rail on the underside of the armrest.
2. Pull out the guide rail.
3. Insert the rear-view mirror with attached rail into the receiver.
4. Retighten the two set screws.

Figure 92 Mounting the rear-view mirror

6.16.4 Bumper Bar

The bumper bar is attached to the rear of the battery case.

Tools:

❒ Allen wrench, size 5 mm

Steps:

1. Place the bumper bar on the battery case at the corresponding holes.
2. Secure with two Allen head screws.

Figure 93 Bumper Bar

6.16.5 Other Optional Add-on Components

INFORMATION

These and other optional add-on components are included in the order form and in the accessories catalogue.

INFORMATION

A rear cover can only be mounted in combination with the optional lighting.

❒ Luggage carrier
❒ Puncture resistant tyres: solid rubber tyres
❒ Tray: attachable tray top
❒ Pocket for mobile phone

7 Diagnostics

NOTICE

Risk of damage due to unauthorised service. Improper or poorly executed repairs may result in the unsafe operation of the power wheelchair. The error diagnosis may therefore only be carried out by authorised dealers who have established knowledge of electronic controllers from Otto Bock.
Otto Bock will not assume any liability for damages that are due to improperly or poorly executed repairs.

INFORMATION

Experience has shown that problems with the wheelchair electrical system are frequently caused by errors and defects in the plug connections and cabling. They should be inspected first for this reason.

INFORMATION

Should you encounter problems while troubleshooting or if you do not manage to completely eliminate a problem by following the measures described here, please contact Otto Bock.

Errors are either shown on the control panel display / LCD monitor (see Section 7.2) or displayed using the handheld programming device. The handheld programming device (see Section 8.4) can capture errors more precisely with the help of error codes. The separate enAble50 instructions for use contain a table with error codes, causes and possible steps for resolution.

7.1 Diagnostic Steps

For an efficient and successful error diagnosis, proceed as follows:

❒ Verify whether the error was generated for a concrete reason or if the error was displayed sporadically.
❒ Check the possible causes in the error display table (see Section 7.2) or the error codes (enAble50 instructions for use) and perform the recommended checks and corrective actions.

7.2 Error Display on the Control Panel/LCD Monitor

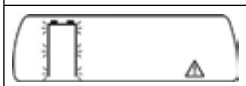
For troubleshooting purposes, the control unit of the XENO power wheelchair identifies the following categories depending on the effect of the malfunction on the system:

❒ Error
❒ Warning
❒ Defect

A warning indicates a status or malfunction of one or several individual components of the XENO power wheelchair.

All problems that have ever occurred are saved in a list and can be retrieved, e.g. in case of a general overhaul of the XENO power wheelchair. The saved data can be used to determine future service and maintenance intervals, for example.

The following table shows the different error messages on the control panel display or separate LCD monitor: In the LCD monitor, the error message also includes the identification number of the error that has occurred (for more detailed information see the enAble50 instructions for use (647G490=D/GB)):

Display symbol(s)	LCD monitor display	Error/warning / defect	Cause	Measures
		Controller temperature warning	Overheating due to excessive load	Cool down phase
		Motor temperature warning	Overheating due to excessive load	Cool down phase
		Motor temperature warning	Control unit has switched to creep speed due to overheating	Cool down phase
		Joystick warning	Joystick not in zero position when switching on	Bring joystick to zero position before switching on
		Hand control device fault	Defective joystick	
		Controller error	Defective controller	
		Communication error (alternating flashing signal)	Faulty connection between the hand control device and controller. Defective cabling, software or hardware	Check cabling/ plug connections
		Battery under voltage	Battery deep discharge	Charge as soon as possible

Display symbol(s)	LCD monitor display	Error/warning / defect	Cause	Measures
		Battery over voltage	Voltage too high (after full charge and driving downhill)	Continue driving slowly
		Seat tilt motor fault	Faulty cabling or plug connection, defective actuator	Check cabling/ plug connections
		Back angle adjustment motor fault	Faulty cabling or plug connection, defective actuator	Check cabling/ plug connections
		Lift seat motor fault		
		Drive motor fault		
		Stand-up device motor fault		
		Brake fault	Open brake release/ defective brake	Close brake release; check brake (e.g. the Bowden cable)
		Emergency stop	Severe fault caused by controller, hand control device, and/or drive motor malfunction	

Table 13 Error display

INFORMATION

The enAble50 instructions for use 647G490=D/GB include a list of error codes “WARNING XXX” and “ERROR XXX” on the LCD monitor as well as information on corrective actions.

8 enAble50 Wheelchair Controller – Installation and Programming

INFORMATION

The enAble50 instructions for use 647G490=D/GB contain more detailed information about the control unit and the connection of input devices.

8.1 Overview

The enAble50 control unit is extremely versatile, featuring smooth operation, good responsiveness and concise colour displays. Various input devices can be used alternately in order to meet the needs of users.

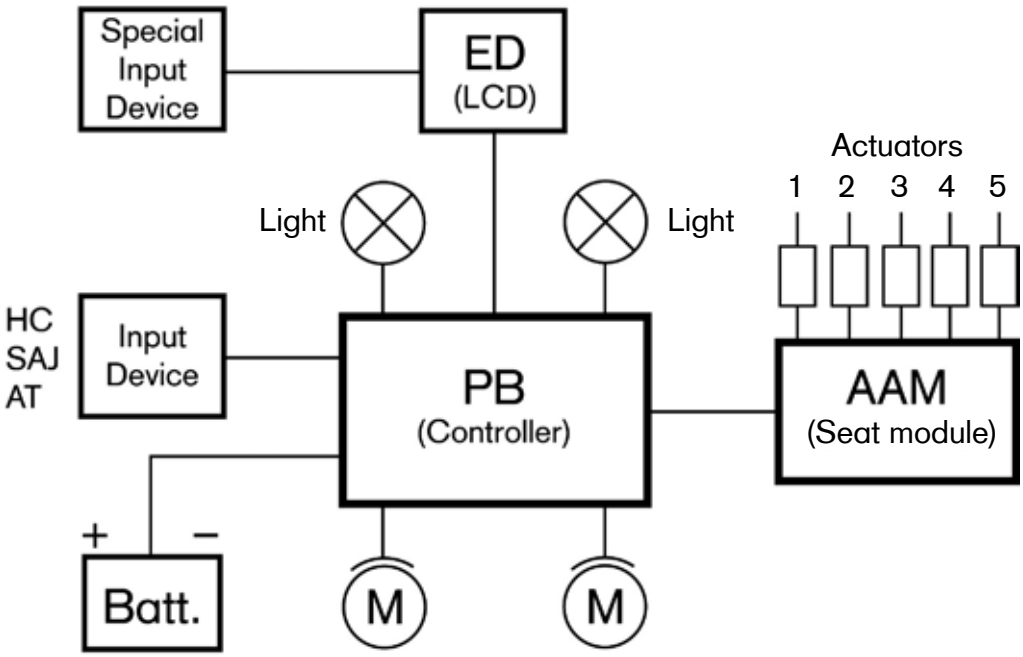


Figure 94 Control unit elements

With the enAble50 control unit, the power wheelchair can indicate the causes of error messages on the display. Error sources in the drive section and in the electric options are indicated by flashing of the corresponding sections in the display's pictogram or a visual display on the separate LCD monitor (see Section 7.2).

The handheld programming device can be used to make parameter changes (available separately).

Figure 95 Components of the enAble50 wheelchair control

1 Attendant control
2 Hand control device
3 Controller
4 Separate LCD monitor

8.2 Controller

The controller is attached to the wheelchair with two screws (see Section 6.4).

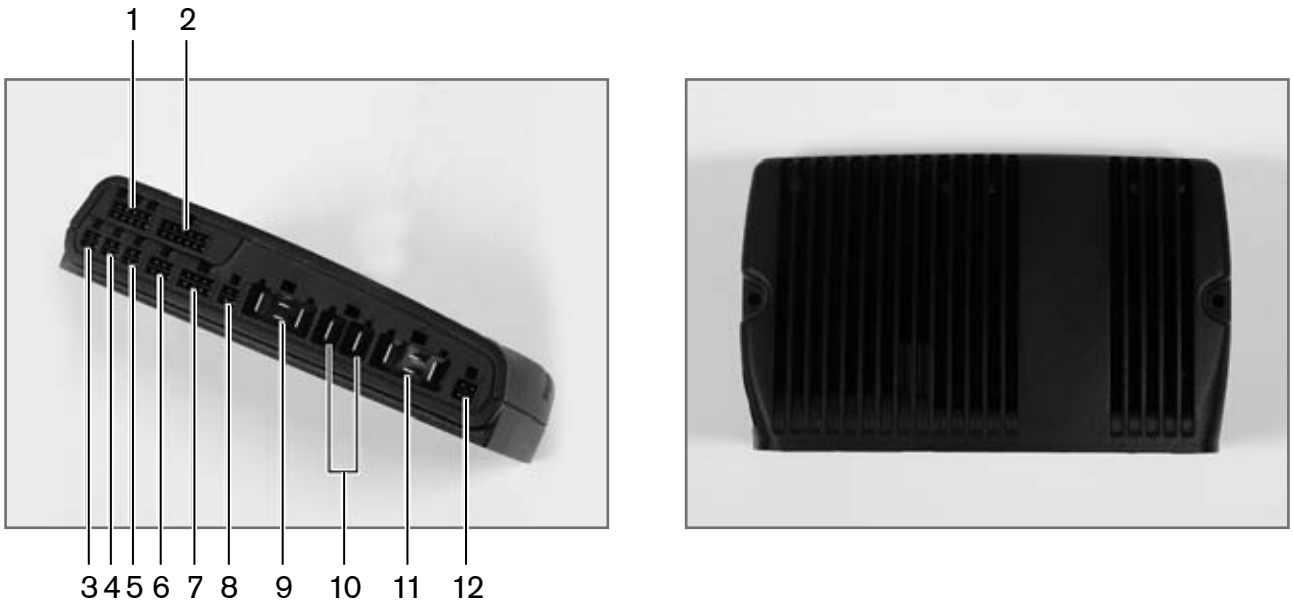


Figure 96 Controller

1 J8 – Actuator 1/2 and driver outputs
2 J9 – Lighting connection
3 J1 – Analogue input connector
4 J2 – Analogue input connector
5 J3 – Analogue input connector
6 J4 – BUS connector
7 J5 – BUS and charger inhibit connector
8 J6 – Encoder/switch connector
9 M1 – Motor 1 connector
10 BATT – Battery connector
11 M2 – Motor 2 connector
12 J7 – Encoder/switch connector

The housing heats up during high-current operation. Therefore, installing the controller on a metal surface with sufficient clearance for air circulation around the housing is recommended. This transfers heat away from the device, improving performance and increasing the lifespan of the controller.

8.2.1 Wiring the Controller

The illustration below shows the wiring of the enAble50 controller for a system that has drive motors equipped with encoders.

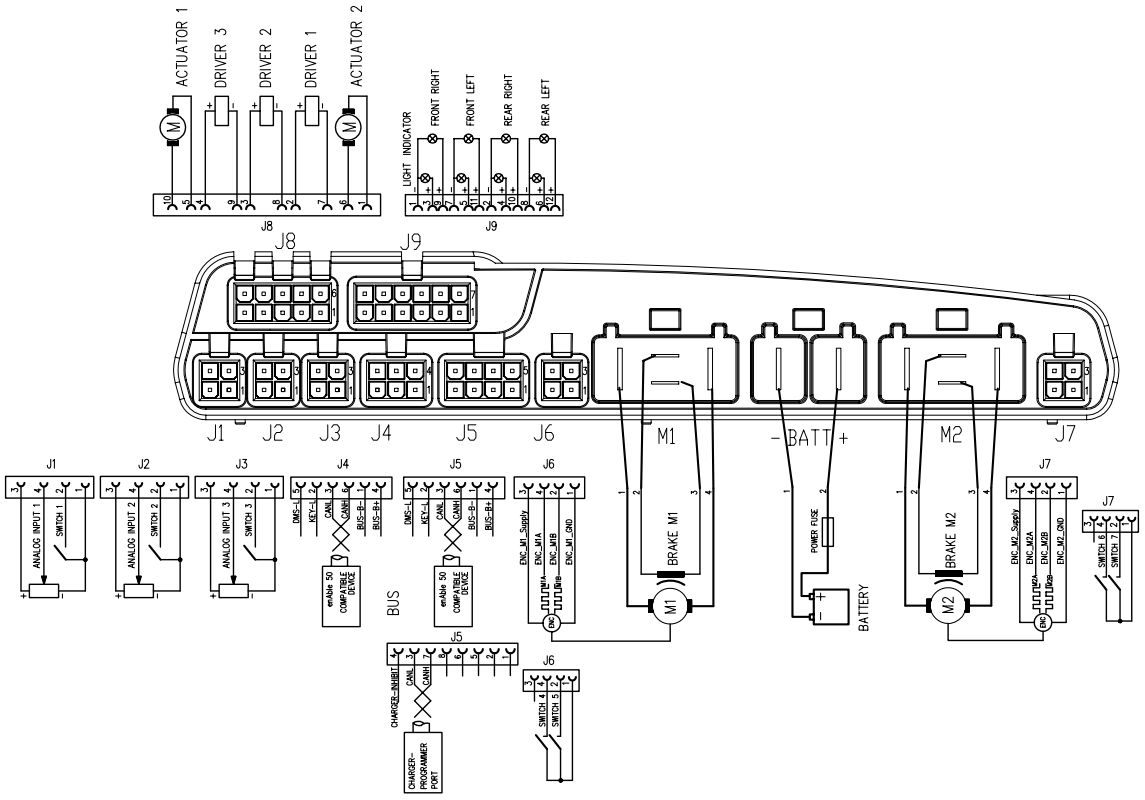


Figure 97 Controller connection schematic

8.2.2 Technical data, connections

	Wire gauge	Mating force
M1, M2: Motors	2,5 – 4 mm²	40 Nm
M1, M2: Brakes	0,5 – 1 mm²	18 Nm
Battery	2,5 – 4 mm²	40 Nm
J4 (bus), J9 (12-pin)	0,5 – 1 mm²	1,5 kg

8.2.3 Actuator outputs

The controller has two independent actuator outputs.

Technical data for the first actuator output:

Voltage	0…100 % V_{Batt}
Current for 20 seconds	20 A
Steady current	10 A

Technische Daten des zweiten Ausgangs:

Voltage	0 … 100 % V_{Batt}
Current for 20 seconds	15 A
Steady current	7 A

The actuator outputs are short-circuit protected. However, short-circuiting the actuator output against the negative pole of the battery while the actuator is in operation may damage the output. The actuators have high impedance when they are not in operation.

8.3 Seat module

The controller is attached to the wheelchair with two screws and can be aligned in any position (see Section 6.4).

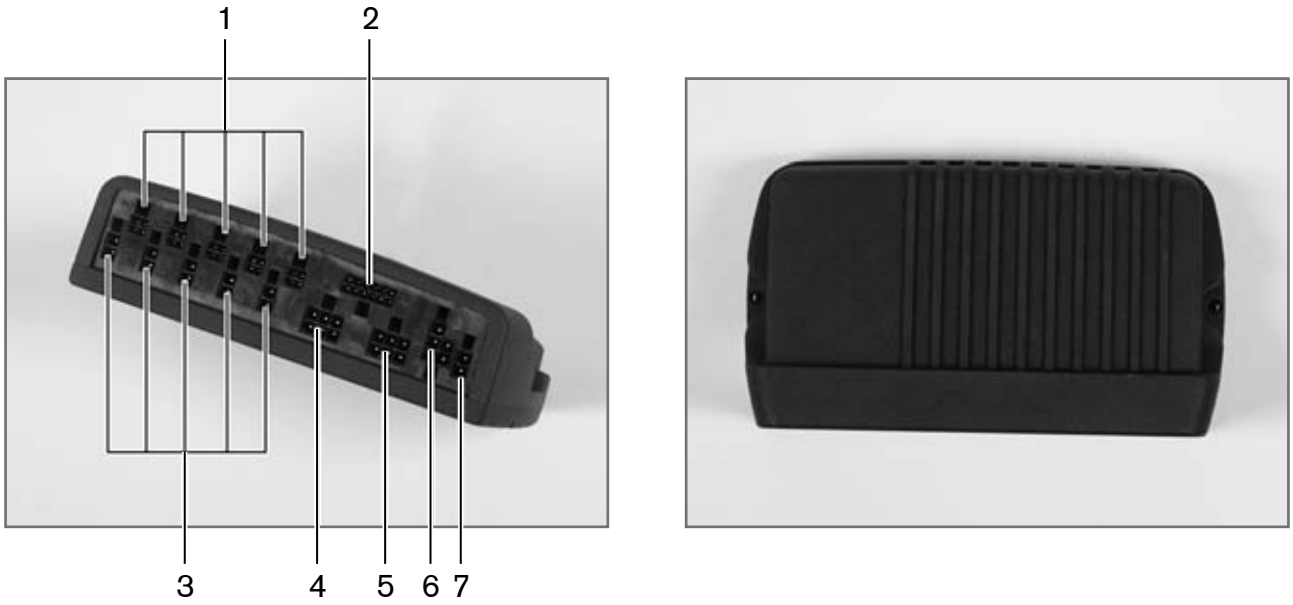


Figure 98 AAM

1 IN-A, IN-B, IN-C, IN-D, IN-E connections
2 RSW
3 A1 - A5 connections (actuators A1 - A5)
4 BUS connection
5 BUS connection
6 BATT bridge/external supply connection
7 12 V DC (connection must be activated by parameter -> On/Off!)

8.3.1 Wiring the Seat Module

The following figure shows how to wire the seat module. The battery connector either has to be connected to the bus (using a 2-pole bridge, see Figure 100, left) or directly to the battery (using the 4-pole plug, see Figure 100, right).

If the seat module is connected directly to the battery, you may also use the battery to supply higher loads.

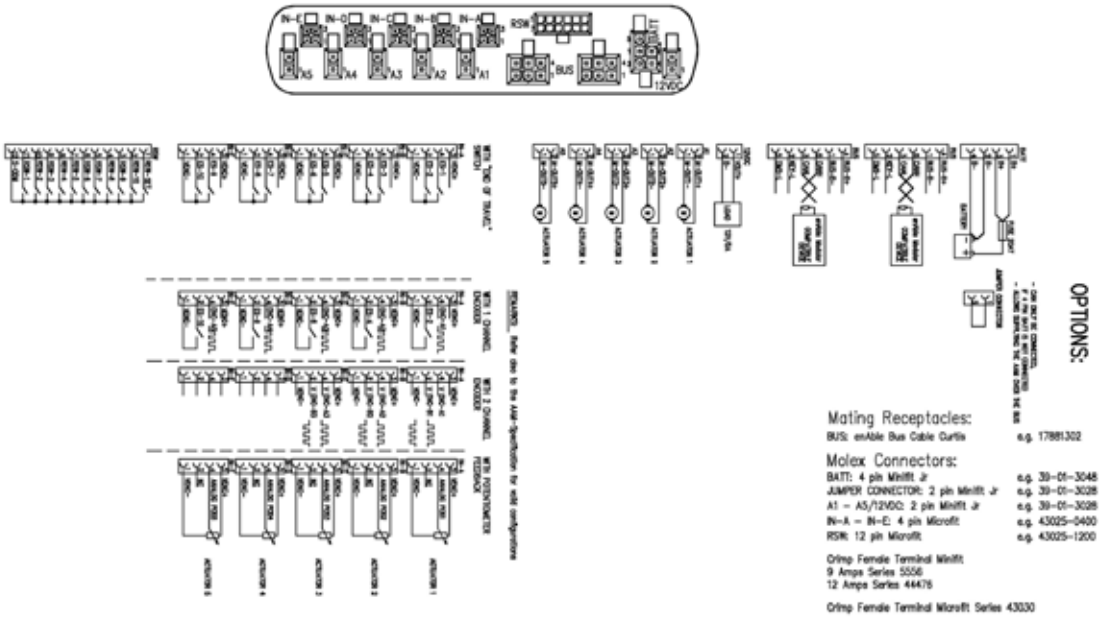


Figure 99 Seat module connection schemata

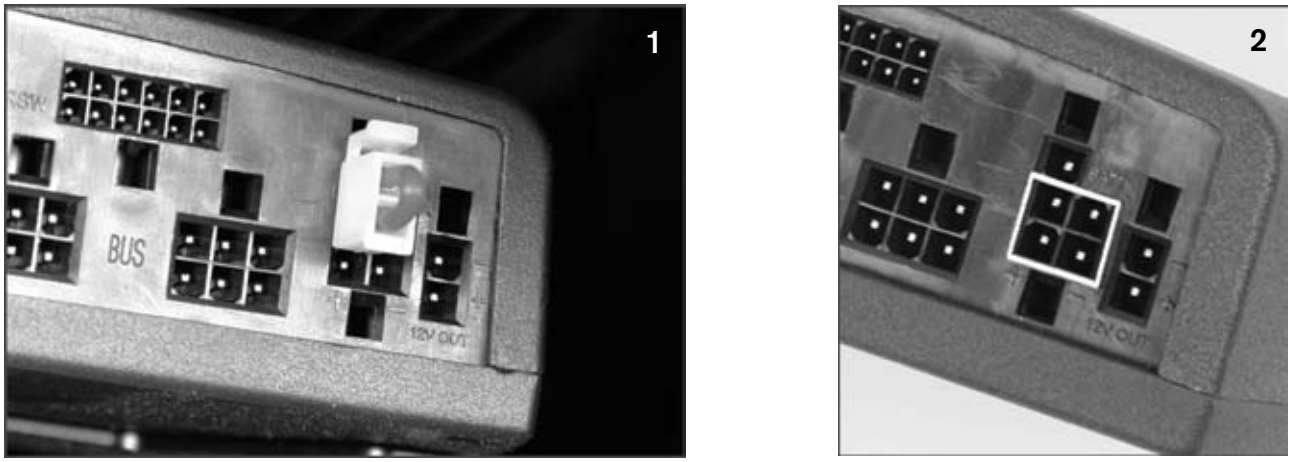


Figure 100 Battery connection for power supply

8.3.2 Electrical Specifications

Power supply

Operating voltage	16 – 33 V
Power supply via bus	12 A
Power supply directly from the battery (continuous)	18 A
Power supply directly from the battery (3 seconds)	24 A
Standby current (typical)	4 mA

A 2-pin bridge between poles 1 and 5 of the battery connector is required for the power supply of the seat module via the bus. If more current is required, the seat module can be wired directly to the battery (poles 1–4). In this case a fuse must be installed as shown in the wiring diagram.

Actuator outputs (A1–A5):

All five actuators can operate forwards or backwards independently in a speed range from 0 to 100%.

Nominal current[1)]	
For 1 second	25 A
For 10 seconds	15 A
Continuous (maximum)	10 A

1) Data apply when only one of the actuators is in operation.

- ❒ Up to 5 actuators may be operated simultaneously. The total current is not permitted to exceed the maximum supply current of 18 A.
- ❒ Each actuator is short-circuit protected (M+ to M-). There is no protection against incorrect wiring between battery B+ or B- and the actuator connector, so that the module could be destroyed in this case.
- ❒ The absolute current limit of the actuators can be set by a parameter. This parameter applies to all actuators.
- ❒ The actuator outputs have high impedance when they are not in operation.

INFORMATION

The enAble50 instructions for use 647G490=D/GB contain information on the power supply and actuator connectors.

8.4 Programming Devices

The enAble50 control unit is programmable, this means that the settings for the various programmable parameters can be set using a programming device. Two programming devices are available: a handheld programming device and a PC programming station (PCPS). The PCPS has additional functions not offered by the handheld programming device. On the other hand, the handheld programming device is more portable. The PCPS is usually used to establish the initial parameter settings, while the handheld programming device is used to make adjustments in the field.

8.4.1 Handheld Programming Device

The handheld programming device (493U36=SK180) is designed for programming, inspection and debugging of the wheelchair modular control system (MCS).

Figure 101 Handheld Programming Device

Control and display elements:

1. **LCD:** Graphic display (128 x 64 pixels) to display functions and parameters.
2. **Cross navigation key:** A control element to navigate the cursor in the menu tree. Press the up / down arrow to move the cursor vertically in the menu tree. Press the right hand arrow at the branch points to open the corresponding sub-functions and press the left hand arrow to close these sub-functions again.
3. **Toggle switch:** This control element is used to increase or decrease the selected parameter values.
4. **Programmable bookmarks:** 3 user-defined bookmarks. This function enables you to jump quickly among various points in the menu tree. To set a bookmark, select an item and press the button for a long moment (at least 3 seconds). Then the cursor will jump to the predefined position by pressing the button quickly.

Initial operation:

1. Turn on the wheelchair control.
2. Ensure the cable is securely connected to the handheld programming device.
3. Connect the bus plug of the handheld programming device to a free bus receptacle (e.g. on the bottom of the display module).

Operation:

a) Display

The interface is displayed using a so-called “menu tree”. The displayed menu tree range may consist of up to 7 lines. The selected function is indicated by a blinking box. The menu tree is branched into several levels, the lowest one containing individual parameters with numerical values displayed on the right edge.

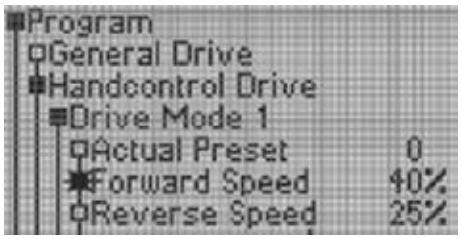


Figure 95 Menu tree

For easier navigation of the selected branch in the menu tree, the display includes nodes (rectangles). They are connected with lines to indicate the relationship between items on the same level in the vertical direction and the depth of branching in the horizontal direction.

The selected branch is indicated with a solid node, while the currently selected function is indicated by a blinking node.

b) Main menu

The main menu of the handheld programming device contains 5 main items.

In the “Program” menu item, the parameters of individual modules can be changed.

“Monitoring” allows you to display the current module status and parameters. Controls status, battery voltage and charge status, motor current and voltage during wheelchair operation as well as other important module data can be used for system analysis.

For debugging purposes, the errors are stored in fault history for the individual modules. In addition to a brief description, the error type, error code, line number and time stamp are stored for evaluation. For the controller, error statistics are created to register the number of detected errors. The error history can be cleared after evaluation or when repairs are completed. All current errors are displayed in system error monitoring. This allows current problems to be identified quickly.

Device data for the individual modules is recorded in the “Information” submenu. This includes the model number, serial number, software and hardware version etc. The last main menu item contains Hand Programming Device Settings.

Here you can change the language and contrast setting as well as identify the determined errors of the device.

c) Changing values

Navigate through the menu tree by moving the blinking cursor using the four-directional button. The respective sublevel can be opened by using the right button in each node until you reach the parameter value level. Parameters can be increased or decreased by pressing the plus or minus symbol on the toggle switch. By pressing the rocker button briefly, the values are changed by small increments; keeping the rocker button depressed for a longer time changes the values by larger increments.

The following list shows the programmable wheelchair parameters.

The monitor values, list of individual modules errors, subitem Information as well as Settings of the Hand Programming Device are not listed here individually. However, the status of the Hand Programming Device can be determined easily in the menu.

INFORMATION

Ensure that the freely accessible parameter for the standard LCD contrast (default value 130) is not changed, because the value quickly leaves the defined range and the font can no longer be distinguished from the background. In that case the Hand Programming Device must be newly adjusted via a PC program.

8.4.2 **PC Programming Station** (PCPS)

The enAble50 control unit can also be programmed with the PCPS 1314 programming station. In addition to the programming software, an interface is required to connect the computer and control unit. An adapter is required to programme the enAble50 wheelchair control unit. Article no. 4 93U32=SK185 includes the programming software, interface and adapter cable.

INFORMATION

For more information on using the software, please consult the enAble50 instructions for use.

8.5 Programmable Parameters

⚠ WARNING

Risk of accidents and injury due to incorrect configuration settings. Modified parameter settings in the configuration can lead to changes in driving characteristics. In particular, changes to the speed, acceleration, braking or joystick settings can lead to unexpected and therefore uncontrollable operating performance with a risk of accidents. Always test the driving characteristics of the power wheelchair after configuration / programming is complete.
Programming must only be completed by authorised personnel. Neither Otto Bock nor the control unit manufacturer are liable for damages (especially in combination with special controls) caused by programming that was not properly / professionally adapted to the abilities of the wheelchair user.

The enAble50 wheelchair control unit includes a number of parameters that can be programmed using the handheld programming device or the PCPS 1314 (see Section 8.4). These programmable parameters allow the driving characteristics and performance of the vehicle to be adapted to special user requirements. Information about the use of the handheld programming device can be found in Section 8.4.1.

8.5.1 Main Parameters

The menu tree is divided into the following three main parameters:

- ❒ Input devices
- ❒ System settings
- ❒ Configuration

Main Parameters	Menu	Submenu	Settings
Input devices	Hand control device settings	Basic setting	5 adaptable profiles: - speed - reaction - mode All drive parameters refer to operation with the hand control device.
		Drive	All parameters that affect driving are listed here. More information on the individual parameters is found in Table 2.
		Entry point	When the system is powered up, it starts at the following point: - Main menu - Favourites - Most recent drive mode - Drive mode 1 - Drive mode 2 - Drive mode 3 - Drive mode 4 - Drive mode 5
		Joystick	More information on the individual parameters is found in Table 3.
		Sound & display	- Commando beep - Backlight - Dimming delay - Beep frequency - Horn frequency
		Miscellaneous	- On/Off switch supervision - Mode switch supervision - Mode switch timing - Mode jack - Bounce button time - Menu navigation mode - Menu timing
	Joystick module	Basic setting	All parameters are equivalent to those for the hand control device. The parameters do not refer to the standard hand control device, but to the stand-alone joystick.
		Drive	
		Joystick	
		Miscellaneous	
	Special input	Basic setting	All parameters are equivalent to those for the hand control device. The parameters do not refer to the standard hand control device, but to input devices such as the mini joystick or 1-5 button input (special input device).
		Drive	
		Settings	
		Entry point	
		Miscellaneous	

Main Parameters	Menu	Submenu	Settings
System settings	General drive	Max speed	The maximum speed parameter forms another layer above the speed values that can be programmed under input devices. Example: Max. speed = 60%. Forward speed = 80%. In driving mode 1: 0.8 x 60% = 48% of the maximum driving speed.
		Maximum RPM	Limits the maximum turning speed.
		Quick stop fwd factor	Factor that determines the deceleration, e.g. if the joystick is released while driving.
		Quick stop rev factor	
		Emergency stop	Parameter that determines the deceleration in case of problems in the control unit, e.g. the wheelchair is turned off while driving.
		Forward tracking	Compensates for speed differences between the right-hand and left-hand motor. Directional stability can be improved.
		Reverse tracking	
		V-steering limit	Determines speed changes in curves.
		Mode button navigation	Defines whether long and short mode signals have different meanings.
		Profile increase stop	
	Rescue drive		All drive parameters if the wheelchair is in an emergency situation (creep speed).
	Wheelchair data		Parameters that relate to the wheelchair base frame, e.g. wheelbase. They should not be changed.
	Reverse beep		A warning signal can be emitted during reverse operation. It can be activated or deactivated in the individual profiles.
	Timing		Various times can be programmed.
		Automatic shutoff	The wheelchair turns off after the time set here. It does not shut down if the setting is 0.
		Latch timeout	After the time specified here, the wheelchair switches from cruise control operation to normal operation.
		Latch timeout deactivated	Specifies whether the cruise control automatically stops after the latch timeout or not.
		Drive timeout	Time between the last driving command and automatically switching to the prior mode. No switching if the parameter is set to 0.
		Aux timeout	Time between the last input command and automatically switching to the prior operating mode. No switching if the parameter is set to 0.
		Menu timeout	Defines the command time for menu operation.
		IR function timeout	Time before the IR menu jumps up one level. No jump if the parameter is set to 0.
	Motor & wheels		Parameters that adapt the drive motors to the controller. The direction of rotation can be changed.
	Registered office	Actuators 1 to 5	Parameters to adjust the seat actuators (speed, current). The seat module offers a separate 12 volt output. The voltage can be turned on or off under the “Miscellaneous” menu item.

Main Parameters	Menu	Submenu	Settings
	Enhanced display with Bluetooth	Sound & display	The display is needed to control external devices using infrared. Bluetooth can only be used to control a computer mouse. Bluetooth must be activated first.
		Mouse	
		Remote control	
	Wheel Lock		Parameters that establish when the brakes engage and disengage.
	Actuators & steering	Actuators	Two actuators can be connected to the controller. For example, speed and current values can be programmed here. If the actuators are intended for steering, e. g. 2 servomotors (Xeno) or 1 servomotor (C2000), they can be programmed under servo.
		Servo	
	Driver outputs	J1	J1-J3 are programmable outputs. Each of them is designed for a 2 A load and set to battery +. Programmable parameters: External horn: Output activated by horn function Ventilator: Output activated when the programmed controller temperature is reached Overvoltage: Output activated when the programmable voltage is exceeded Reverse motion: Output activated during reverse motion System on: Output activated when the system is turned on
		J2	
		J3	
	Light		Parameters for light and direction indicator settings
	Battery		Parameters for battery settings, which are very time-consuming to establish. The default settings should be retained.
	Reset distance		Trip and total distance readings can be reset.
	Reset hourmeter		Resets the hours of operation for the drive motors.
	Drive-away lock (System lock)		Turns the drive-away lock function on / off. The lock is activated when the mode button is pushed and held for approximately 5 seconds or the corresponding menu item is selected from the aux menu. However, the mode button cannot be used in this manner if the “smart button” parameter is activated, since the long mode command is used to shut down the system in this case. Value: On / off.
Configuration	Save system configuration		Saves the system configuration with all modules and checks whether all modules are present.
	Remote control		The menu tree for the enhanced display with Bluetooth (LCD) can be set up here. The structure is customisable.
	Registered office	Actuator configuration	The existing seat actuators (functions) are assigned to the outputs in the seat module. Possible limitations can be programmed via end switches.

Main Parameters	Menu	Submenu	Settings
	Actuators & steering		The controller actuators can be configured here. Very important setting that establishes the respective wheelchair model. Steering is defined according to the following possibilities: normal, 1 servo and 2 servos. Two additional standard actuators can be programmed with normal steering and 1 standard actuator can be programmed with 1 servo steering, e.g. for the tilt function or backrest. Possible limitations can be programmed via end switches.

Table14 Main parameter settings

8.5.2 "Drive" Parameter Settings

Menu tree	Access	Min	Max	Spec.	Unit	Help text
Input devices > Hand control device settings > Drive > Profile 1P1 > Forward speed (Fwd Speed)	Technical Service	5	100	20	%	Maximum forward driving speed Determines the highest possible forward driving speed at full deflection when the position of the potentiometer is set to maximum. If the position of the potentiometer is between minimum and maximum, the highest possible forward driving speed is scaled linearly. Ensure the user can operate the wheelchair safely at maximum speed.
Input devices > Hand control device settings > Drive > Profile 1P1 > Reverse speed (Rev Speed)	Technical Service	5	100	20	%	Maximum reverse driving speed Determines the highest possible reverse driving speed at full deflection when the position of the potentiometer is set to maximum. If the position of the potentiometer is between minimum and maximum, the highest possible reverse driving speed is adjusted linearly. Ensure the user can operate the wheelchair safely at maximum speed.
Input devices > Hand control device settings > Drive > Profile 1P1 > Turning speed (Turn Speed)	Technical Service	5	100	10	%	Maximum turning speed Determines the highest possible turning driving speed at full deflection when the position of the potentiometer is set to maximum. The turning speed is normally set to a much lower value than the forward driving speed. If the position of the potentiometer is between minimum and maximum, the highest possible turning speed is scaled linearly. Ensure the user can operate the wheelchair safely at the selected speed.

Menu tree	Access	Min	Max	Spec.	Unit	Help text
Input devices > Hand control device settings > Drive > Profile 1P1 > Forward acceleration (Fwd Accel)	Technical Service	5	100	20	%	Maximum forward acceleration Specifies the forward acceleration of the wheelchair when the position of the potentiometer is set to maximum. A high value represents a short acceleration time and a fast start. High acceleration values result in abrupt speed changes and should only be used in special cases. If the position of the potentiometer is between minimum and maximum, the forward acceleration is adjusted linearly. Ensure the user can operate the wheelchair safely at maximum acceleration.
Input devices > Hand control device settings > Drive > Profile 1P1 > Forward deceleration (Fwd Decel)	Technical Service	5	100	20	%	Maximum forward deceleration Specifies the forward deceleration of the wheelchair when the position of the potentiometer is set to maximum. A high value represents a short deceleration time and a rapid stop. High deceleration values result in abrupt speed changes and should only be used in special cases. If the position of the potentiometer is between minimum and maximum, the deceleration is adjusted linearly. Ensure the user can operate the wheelchair safely at maximum deceleration.
Input devices > Hand control device settings > Drive > Profile 1P1 > Reverse acceleration (Rev Accel)	Technical Service	5	100	20	%	Maximum reverse acceleration Specifies the reverse acceleration of the wheelchair when the position of the potentiometer is set to maximum. A high value represents a short acceleration time and a fast start. High acceleration values result in abrupt speed changes and should only be used in special cases. If the position of the potentiometer is between minimum and maximum, the reverse acceleration is adjusted linearly. Ensure the user can operate the wheelchair safely at maximum acceleration.
Input devices > Hand control device settings > Drive > Profile 1P1 > Reverse deceleration (Rev Decel)	Technical Service	5	100	20	%	Maximum reverse deceleration Specifies the reverse deceleration of the wheelchair when the position of the potentiometer is set to maximum. A high value represents a short deceleration time and a rapid stop. High deceleration values result in abrupt speed changes and should only be used in special cases. If the position of the potentiometer is between minimum and maximum, the reverse delay is scaled linearly. Ensure the user can operate the wheelchair safely at maximum deceleration.

Menu tree	Access	Min	Max	Spec.	Unit	Help text
Input devices > Hand control device settings > Drive > Profile 1P1 > Turning acceleration (Turn Accel)	Technical Service	5	100	10	%	Maximum turning acceleration Specifies the turning acceleration of the wheelchair when the position of the potentiometer is set to maximum. A high value represents higher turning acceleration and more rapid direction changes. High turning acceleration values result in abrupt direction changes and should only be used in special cases. If the position of the potentiometer is between minimum and maximum, the turning acceleration is scaled linearly. Ensure the user can operate the wheelchair safely at maximum acceleration.
Input devices > Hand control device settings > Drive > Profile 1P1 > Turning deceleration (Turn Decel)	Technical Service	5	100	10	%	Maximum turning deceleration Specifies the turning deceleration of the wheelchair when the position of the potentiometer is set to maximum. A high value represents higher turning deceleration and more rapid direction changes. High turning deceleration values result in abrupt direction changes and should only be used in special cases. If the position of the potentiometer is between minimum and maximum, the turning acceleration is scaled linearly. Ensure the user can operate the wheelchair safely at maximum deceleration.
Input devices > Hand control device settings > Drive > Profile 1 P1 > Latch Forward LatchFor	Technical Service	0	2	0		Constant speed forward / reverse If „Constant speed“, cruise, is selected, the wheelchair accelerates to the desired speed. If the command is reduced, the wheelchair maintains the speed. Direction changes are always possible. The wheelchair decelerates if an opposing command of 50% or less is issued. A stop is achieved via a mode button command or an opposing command of more than 50%. If „Constant speed“, stepped, is selected, the wheelchair accelerates by one increment with each short command (33%, 66% and 100%) up to the maximum speed. Direction changes are always possible. The wheelchair decelerates by one increment (e.g. from 66% to 33%) when a brief opposing command of 50% is issued. A stop is achieved via a mode switch or with a permanent opposing command. ⚠ WARNING **Risk of injury due to incorrectly installed control buttons.** Never select “Constant speed” mode (cruise or stepped) unless the mode button is installed so that the user can operate it quickly at any time.

Menu tree	Access	Min	Max	Spec.	Unit	Help text
Input devices > Hand control device settings > Drive > Profile 1P1 > Latch Reverse LatchRev	Technical Service	0	2	0		Constant speed forward / reverse If „Constant speed“, cruise, is selected, the wheelchair accelerates to the desired speed. If the command is reduced, the wheelchair maintains the speed. Direction changes are always possible. The wheelchair decelerates if an opposing command of 50% or less is issued. A stop is achieved via a mode button command or an opposing command of more than 50%. If „Constant speed“, stepped, is selected, the wheelchair accelerates by one increment with each short command (33%, 66% and 100%) up to the maximum speed. Direction changes are always possible. The wheelchair decelerates by one increment (e.g. from 66% to 33%) when a brief opposing command of 50% is issued. A stop is achieved via a mode switch or with a permanent opposing command. ⚠ WARNING **Risk of injury due to incorrectly installed control buttons.** Never select “Constant speed” mode (cruise or stepped) unless the mode button is installed so that the user can operate it quickly at any time.
Input devices > Hand control device settings > Drive > Profile 1P1 > Power	Technical Service	20	100	100	%	Performance The power parameter may be less than 100% to limit the maximum torque. Limiting the torque reduces the power of the wheelchair. This can prevent dangerous collisions or crossing obstacles. Reducing torque usually only makes sense for indoor operation. After reducing the torque, ensure the user is able to cross any obstacles that need to be crossed.

Table 15 “Drive” parameter settings

8.5.3 “Joystick” Parameter Settings

Menu tree	Access	Min	Max	Spec.	Unit	Help text
Input devices > Hand control device settings > Joystick > Centre deadband	Technical Service	10	50	20	%	Centre deadband Centre deadband defines the joystick travel before the system recognises the command. The value corresponds to a circle around the joystick zero point. No movements or commands are executed unless the joystick is moved beyond this circle. Increasing this value is useful if the operator has a pronounced hand tremor.
Input devices > Hand control device settings > Joystick > Switch operation	Technical Service	Off	On	Off	On/ Off	Switch function The joystick can be used like a switch. If the switch function is ON, the proportional function is replaced by a switch function. Moving the joystick from the centre by more than 50% generates a 100% command in the desired direction.
Input devices > Hand control device settings > Joystick > Tremor suppression	Technical Service	0	100	0	%	Tremor suppression: Suppresses a tremor on the joystick. 0 % -> Tremor suppression deactivated 100 % -> Maximum tremor suppression INFORMATION If a brief command is used for system operation (e.g. if “3 direction profile” is selected), tremor suppression should not exceed 90%. If tremor suppression exceeds 90% in such a case, the brief command is ignored.

Table 16 “Joystick” parameter settings

9 Maintenance and Service Plan

Customer

Re-use

Yes	No

Year of manufacture:	Serial no.:

XENO power wheelchair – general condition

Driving report:

Component (group)

Check functionality, settings, damage or deformation and screw connections for all components listed here!

		OK	Damage	Replacement
1	**Control Unit**			
	Control unit holder			
	Control cable			
	LCD monitor (if present)			
2	**Batteries**			
	Battery cover			
	Cabling			
3	**Motors**			
	Brake release			
4	**Tyres**			
	Drive wheels			
	Casters			
5	**Frame**			
	Drive unit sustainer			

Maintenance and Service Plan XENO Power Wheelchair

6	**Registered office**			
	Back cushion			
	Seat Cushion			
	Supports			
7	**Stand-up device**			
	Actuator			
	Rod assembly			
	Cabling			
	Belt systems			
8	**Footplate**			
	Adapters			
9	**Options**			
	Lighting			
	Other			

Comments:

The maintenance service was carried out by:	Place / date:	Signature

Kundenservice/Customer Service

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Otto Bock Mobility Solutions GmbH has been certified by the German Society for the Certification of Quality Assurance Systems (DQS) in accordance with DIN EN ISO 13 485 : 2007, reg. no. 435514 MP27 (management system)

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